BEYOND COMPREHENSIVE KNOWLEDGE IN HEALTHY LIFESTYLE CHOICES: THE CASE OF GENDER ROLE ATTITUDES, ECONOMIC STATUS AND ABILITY TO NEGOTIATE SAFER SEX AMONG HETEROSEXUAL MARRIED/COHABITING WOMEN IN GHANA.

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DEDICATION

This thesis is dedicated to

my unborn children

with love

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ABSTRACT

This study adopts the integral theory to develop a theoretical model that explicates collective/contextual factors (i.e., gender role attitudes and economic status) affecting the relationship between comprehensive knowledge of HIV/AIDS and heterosexual married/cohabiting women's ability to negotiate safer sex.

This thesis was based on a multilevel moderation model utilizing a nested sample of 1150 married/cohabiting women in 382 household clusters based on a secondary data of a nationally representative sample from the Ghana Demographic and Health Survey-2014. The results show that the main predictor variable comprehensive knowledge of HIV/AIDS was positively associated with the ability to negotiate safer sex (OR = 1.46, $p < .001$). Also, a significant interaction effect of gender role attitudes (OR = 0.91, $p < .005$) and economic status (OR = 0.68, $p < .01$) on the relationship between comprehensive knowledge of HIV/AIDS and women's ability to negotiate safer sex was reported. The key finding of the study is that comprehensive knowledge on HIV/AIDS influenced women's ability to negotiate safer sex, but that this process was dependent on gender role attitudes and women's economic status.

The results of this study suggest the interplay of scope conditions at the individual and collective levels and provides a multilevel perspective into determinants that shape women's ability to negotiate safer sex. The results of marginal effects seem to suggest that a healthy individual life goes together with a good and nurturing society by fostering women empowerment and financial independence in their relationships.

The thesis extends the discussion about a holistic approach to health promotion initiatives. Drawing on relevant and allied research, this thesis discuses theoretical and practical implications and offers directions for future research towards more scientific, systematic and evidence-based practices of health promotion programmes that address women vulnerability in Ghana.

Keywords: Gender role attitudes, knowledge of HIV/AIDS, multilevel, negotiating safer sex.

CHAPTER ONE: INTRODUCTION

Background

Human Immune Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) remains a development challenge, albeit the significant efforts from the global community. HIV/AIDS, a substantial contributor to the global burden of disease (Maartens, Celum, & Lewin, 2014), has enormous implications for human security, social and political stability and economic development. One such development challenge is the increasing gender differences in HIV/AIDS prevalence (Coates, Richter, & Caceres, 2008; UNAIDS, 2018; Wang, Alva, & Wang, 2012). Women continue to explain a disproportionate proportion of new HIV infections among adults. In the case of sub-Saharan Africa, women account for 59% of the 980 000 million [820 000–1 100 000] new adult HIV infections in 2017 (UNAIDS, 2018). Justification for the disproportionate gender differences in HIV prevalence has been a subject of research inquiry. Indeed, heterosexual intercourse continues to play a primary mode of HIV infection and accounts for over 90% of new infections among adults worldwide (Kharsany & Karim, 2016). Albeit, advancement in treatment, we cannot rely on treatment as the solution to the HIV/AIDS challenge. Walker and Burton (2008) assert that we do not have the tools to make an HIV vaccine. Perhaps, findings from a recent study have shown antiretroviral therapy as the most potent intervention to reduce sexual transmission of HIV (Cohen et al., 2011). Regardless, the vulnerability will persist in the context of low-income countries where the burden of disease is high and investment in healthcare has generally lagged (Hecht et al., 2010). With a Gross Domestic Product per head of $1025 (Dutta, Barker, & Kallarakal, 2015; Steinbach, 2019) in low-income countries, many people will not be able to afford treatment. Notwithstanding, over two decades of significant advances in the delivery of HIV prevention and treatment, (Piot et al., 2015), an effective vaccine remains elusive (Kharsany & Karim, 2016; Maartens et al., 2014). Thus, the rhetoric, what actions can be adopted to address the epidemic among women who find themselves in this socio- economic environment? At least the efficacy of safer sex (i.e., condom use or abstinence) is herald as a promising and less costly preventive measure and will be especially true in the case of low-income countries. Indeed, the ability to negotiate safer sex, which breaks down into assertiveness about initiating wanted sex, refusing unwanted sex, and using contraception or STI protection, is imperative for women in attaining their sexual intimacy and safety goals as well (Morokoff et al., 1997; Noar, Carlyle, &

Cole, 2006). Prevention, even though not the silver bullet solution, is a feasible solution with wide-reaching positive impact (Cohen, 2007; Crepaz & Marks, 2002; Noar, 2007; Wang et al., 2012).

However, HIV/AIDS prevention requires people to exercise influence over their behaviour and their social environment (Amaro, 1995; Amaro & Raj, 2000; Coates et al., 2008; Cohen, 2007). Traditional efforts designed to control the spread of HIV/AIDS is by informing the public about the phenomenon. Perhaps premised on the assumption that a well-informed person on the threats of HIV/AIDS is likely to take appropriate self-protective action (e.g., negotiate for safer sex) in the case of women. Unfortunately, how does this serve the purpose given the social and structural barriers that may influence health impairing habits?

Contemporary discourse on healthy action as called for attention to the interplay of individual factors and the socio-economic environment (Coates et al., 2008; Green, Cross, Woodall, & Tones, 2015). Indeed, the field of health promotion has challenged a 'victim blaming' approach to a more comprehensive analysis of the factors that influence health and well-being (Green et al., 2015). Accordingly, this study seeks to illustrate an understanding of how comprehensive knowledge of HIV/AIDS promotes the ability to negotiate safer sex with boundary conditions among heterosexual women. Thus, this study investigates the contextual factors of gender role attitude, economic status, and other demographic characteristics in relation to married/cohabiting women's ability to negotiate safer sex. Overall, this study seeks to contribute to a deeper understanding of the enabling factors relevant to the discourse on addressing how HIV/AIDS transmission can be resolved among women in other to bridge the gendered difference in HIV prevalence within sub-Saharan using Ghana as an exemplar.

Patriarchy and Sexual Behaviour of Women

In a patriarchal system – which reflects social attitudes and norms around the role of women in relation to men, women are often considered as the property of men (Black, Weisz, & Bennett, 2010). Women are deemed to be in a weaker position partly to the difference in social roles (van de Vijver, 2007) which may put them at risk as far as their ability to negotiate safer sex is a concern. However, depending on the context that women find themselves in, the risk might not be the same for all women.

Indeed, Kandiyoti (1988) concept of 'patriarchal bargain' brings forward how women face different 'rules of the game' - social norms depending on the context limiting what women and men can and cannot do sexually. Besides the influence of these rules, on women's gendered subjectivity, the rules also act as the underlying mechanism through which women negotiate and evaluate their choices (Salway, Jesmin, & Rahman, 2005). Thus, covertly the variances in bargaining power between men and women are mainly governed by social norms (Agarwal, 1997; Wingood & DiClemente, 2000). The 'rules of the game' may include what women cannot challenge (Agarwal, 1997). For example, Kandiyoti (1988) makes mention that, women are socially expected to provide sexual services to their husbands, and this may go uncontested by women.

Despite these social norms that dictate the subservient behaviour of women, ironically, these same social norms may also provide the legitimate bases for which woman can refuse or initiate sex (Wolff, Blanc, & Gage, 2000). That is, certain sexual practices such as oral sex because of cultural and religious prohibitions, women have the power to resist such sexual encounters (Rivers et al., 1998). More so, Macintyre, Hunt, and Sweeting (1996) posit ongoing transition in the gendered allocation of social roles may change the narrative. Indeed, within the Economic theory discourse, an increase in economic resources of a woman may mitigate the effect of social norms and perhaps better position women to negotiate for themselves (Beegle, Frankenberg, & Thomas, 2001; Quisumbing & Maluccio, 2003).

Women's Control Over their Sexuality in Ghana

Sexual behaviour in Ghana, like other societies is in transition as such certain social norms that used to restrict women's expression either have lost or are losing, their effectiveness (Anarfi, 1993). However, there is still evidence of patriarchy (Boakye, 2009; Takyi & Nii-Amoo Dodoo, 2005). Women are expected to be subservient to their male partners especially married women (Amoakohene, 2004). For example, women are expected to accept and not respond to physical, emotional, and sexual abuse from male partners and also take care of their husbands (Amoakohene, 2004; Ofei-Aboagye, 1994).

Historically, marriage among the various ethnic groups in Ghana confers on a husband exclusive sexual rights and domestic services of the wife, and these sexual rights and domestic services applies only to women (Oppong, 1974; Sarpong, 1977). To the extent that sexual intercourse is a marital duty, some authors (Awusabo-Asare, Anarfi, & Agyeman, 1993; Fortes, 1954) posit that

marriage is a desired status for both men and women but women in particular, irrespective of educational or employment status, are expected to marry and have children. In at least one empirical study in Ghana, evidence seems to suggest that a woman's refusal to have sex with the husband could imply an allowance for the husband to engage in extramarital relations and could lead to divorce though not legally binding on women but a social construct. (Awusabo-Asare et al., 1993). Despite the exclusive sexual rights of males, traditional marriages are polygamous in most cases (Archampong, 2010). Furthermore, a married woman can be accused of infidelity by the partner if she asks the partner to use a condom (Bracher, Santow, & Watkins, 2004). This can limit a woman in such a marriage to negotiate for safer sex (i.e., refuse to have sexual relations with her husband or demand condom use), although the pattern varies across demographics such as rural-urban and religious affiliations.

Research Objectives

Based on the above background, the overall objective of this thesis is to examine the interplay of individual factors (i.e., comprehensive knowledge of HIV/AIDS) and collective/contextual factors (gender role attitudes and economic status) on women's ability to negotiate safer sex taking samples from the Ghana Demography and Health Survey 2014. The following are the specific objectives;

1. To examine the relationship between comprehensive knowledge of HIV/AIDS and women's ability to negotiate safer sex in a heterosexual setting.

2. To test the contextual influence of gender role attitudes and economic status on the relationship between knowledge of HIV and the ability to negotiate safer sex.

Epidemiology of HIV/AIDS in Ghana

The first case of AIDS diagnosed in Ghana was in March of 1986 (Ali et al., 2019). Ghana unlike other countries (e.g., South Africa (25%), Nigeria (13%), Mozambique (6%), Uganda (6%), Tanzania (6%), Zambia (4%), Zimbabwe (6%), Kenya (6%), Malawi (4%) and Ethiopia (3%) have managed to contain the epidemic (see Figure 1). According to the Ghana Demographic and Health Survey report of (2015), HIV prevalence in Ghana over the last decade has remained on average about 2% in adults 15-49 years. In a report by the Ghana AIDS Commission (2017), adult national

HIV prevalence for 2017 was 1.6% and projected to drop further to 1.51% by 2022. As of 2017 313,063 persons were living with HIV/AIDS.

In terms of gender distribution, approximately 65% of the HIV population is female with a male to female ratio of 1:1.9. The proportion of females newly infected is averagely 63%. Furthermore, annual female deaths were higher than males (51%) in 2017 per the Ghana AIDS Commission (2017) report. HIV prevalence rates are not uniform across the country; prevalence is high in densely populated areas, mining and border towns, and towns along primary transportation routes. Most of the HIV infected population by regional distribution are, in the Eastern (35%), Ashanti (29%) and the Greater Accra (12%). In terms of Knowledge about HIV prevention in young men vs women there is a disproportion in distribution as depicted in figure 2. Thus, about 27.2% of young men have knowledge about HIV prevention as against 20% for young women. This has implication for young women's ability to make informed decisions about their sexuality and be able to approach relationships with more self-confidence before becoming sexually active as compared to young men.

The primary mode of HIV/AIDS transmission in Ghana is through heterosexual intercourse, which accounts for up to 80% of all HIV/AIDS infections. Mother to child transmission also accounts for 15%, and transmission through blood and blood products accounts for 5%. (Ghana AIDS Commision, 2017).

Figure 1: Incidence of HIV: The share of new infections among the previously uninfected population (ages15-49), 1990 to 2017

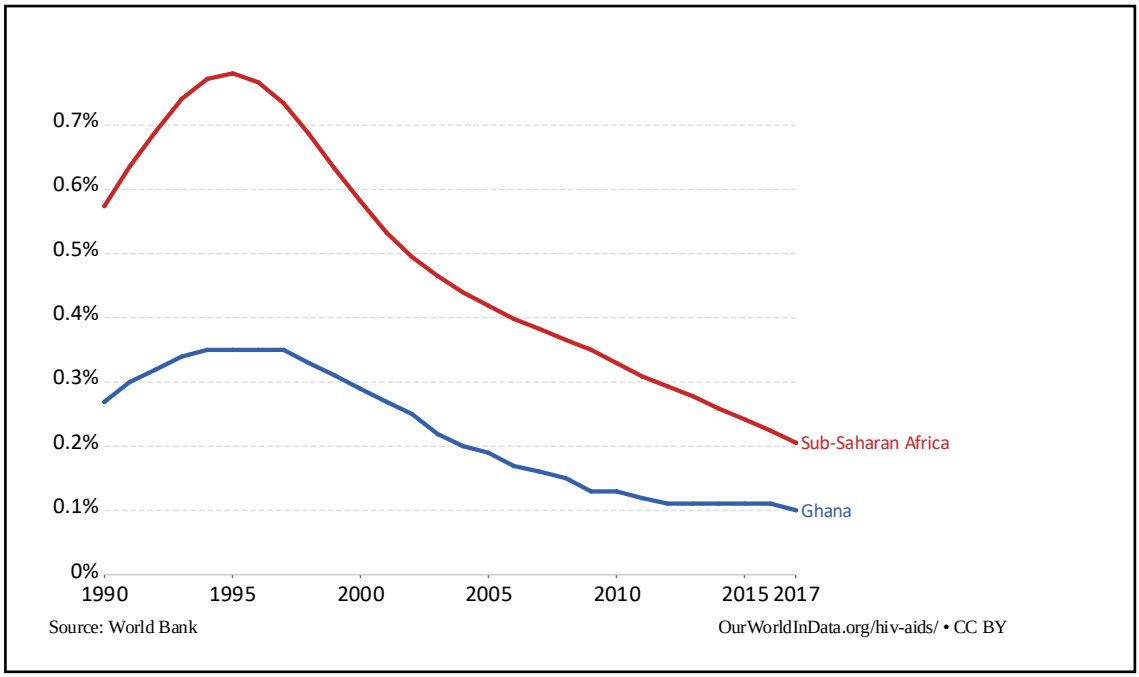
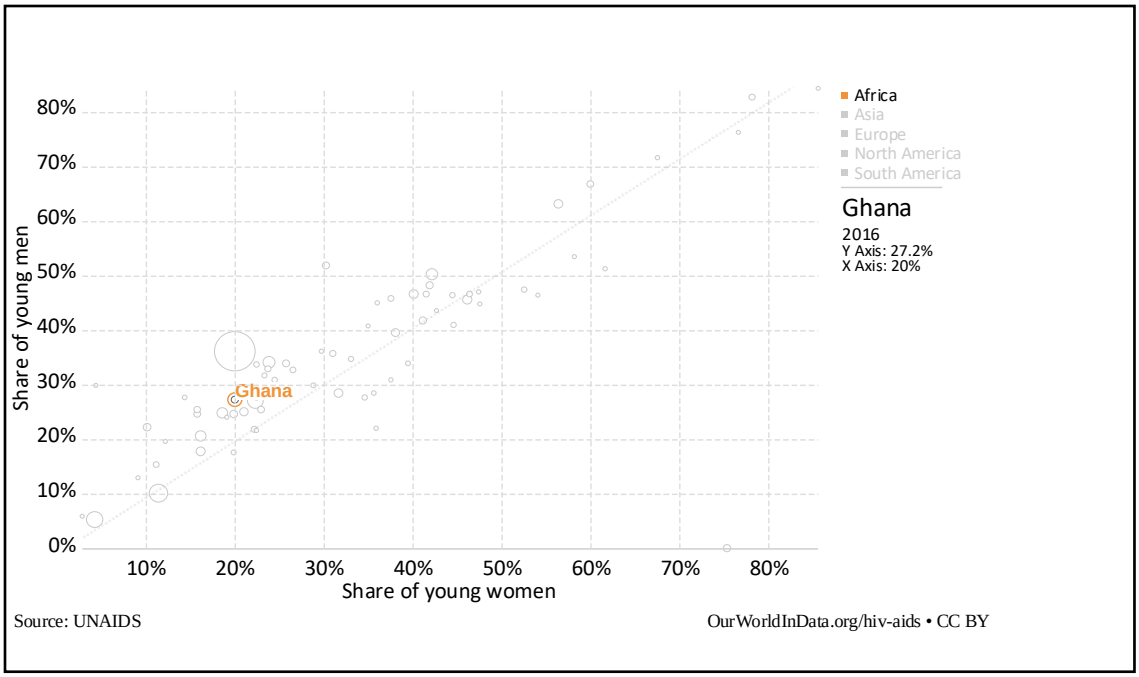


Figure 2: Knowledge about HIV prevention in young men vs women, 2016: share of men vs women aged 15-24 years old who could answer a full set of questions about HIV prevention



Ghana's Programmatic Response to HIV/AIDS

Over the years, the Government of Ghana's responses to the threat posed by HIV/AIDS is mixed. The initial response during the period 1986- mid-2000 was characterized by a medical approach, in which the disease was managed as an individual health issue (Akwara, Fosu, Govindasamy, Alayòn, & Hyslop, 2005). A short-term plan for HIV prevention and control was implemented following the setting up of a technical committee in 1985 to advise the government. A significant outcome was the implementation of the national HIV Sentinel Surveillance system in 1990 by the Ministry of Health. Since 1994 an annual HIV sentinel survey has been conducted at antenatal care clinics for pregnant women, and sexually transmitted infection centres for patients with STIs (Ali et al., 2019). Currently, in line with achieving the UNAIDS 90-90-90 targets and meeting the Sustainable Development Goals (SDGs), the national AIDS coordinating authority (i.e., Ghana AIDS Commission) has adopted a multi-sectoral approach to combat the epidemic (Akwara et al., 2005). The approach cuts across the prevention of new infections to the mitigation of the impact of the disease.

Sociodemographic Profile of Ghana

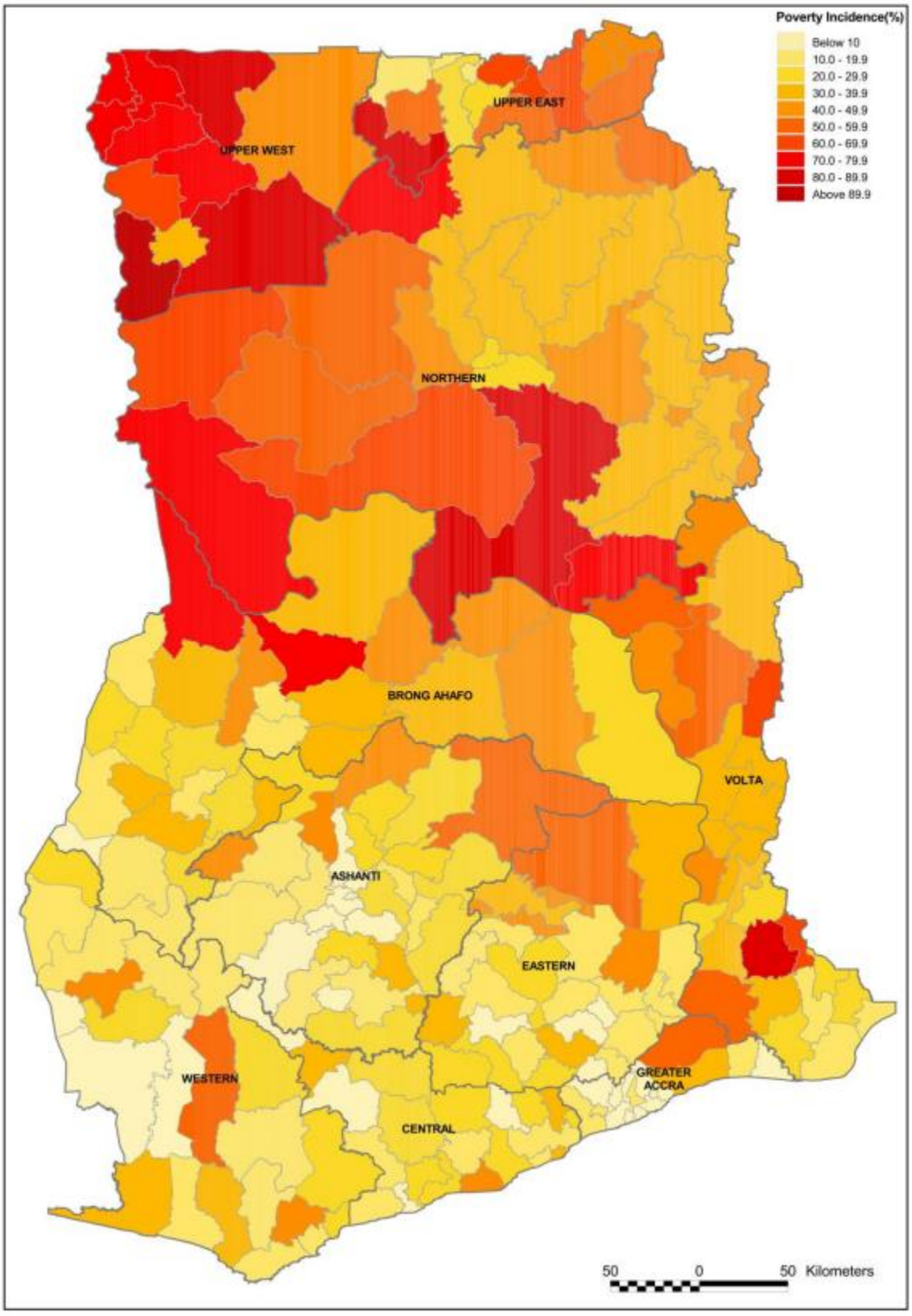
Ghana's population is approximately 27 million and consists of 16 administrative regions. Ghana, like most countries in Africa, is a multi-ethnic, multi-religious and multicultural society. The major religious groups are Christianity, Islam and Traditional religions. Pentecostal-Charismatic is the dominant religion, followed by approximately 41.2 % of the total population, followed by Islam (15.2 %) (Ghana Statistical Service - GSS, Ghana Health Service - GHS, & ICF, 2018). When compared to other counterparts, Ghanaians are among the most religious people in the world (Galen, 2012). The Akan's constitute the largest ethnic group (48 %), followed by the Mole-Dagbani (17 %), Ewe (14 %), Ga-Dangme (7 %), and others (Ghana Statistical Service - GSS et al., 2018). As depicted in figure 3, geographically, there is a high concentration of poverty in the North-Western part of Ghana as compared to Southern Ghana, where there is a low concentration of poor people (Ghana Statistical Service - GSS, 2015).

Contribution of The Study

This thesis attempts to address the interplay of cognitive-behavioural and social-structural factors associated with the sexual decision-making of women. Indeed, these antecedents have contributed to the gendered inequities in HIV/AIDS prevalence (Amaro & Raj, 2000; Coates et al., 2008). Inequities exist where there is a difference in health status or the distribution of health resources between population groups due to the society, in which people are born, grow, live or work (Green, Cross, Woodall, & Tones, 2015). The Constitution of WHO states that every human being has the right to the "highest attainable standard of health", independent of, e.g. social position (p. 1). Drawing on Ken Wilber's integral model, this thesis provides support to the rethinking on a holistic approach to the factors that limit women's ability to negotiate safer sex.

By examining the contextual factors, gender role attitudes and economic status, the thesis provides support to the social and structural environments discourse in Health promotion which emphasizes the importance of various social and environmental aspects for health, over and above the role of individual behaviour. The acknowledgement of this is a core principle in health promotion (Green et al., 2015). Although health promotion is action-oriented, integrative empirical studies with a focus on health promotion issues are essential for a systematic and evidence-based action or implementation practices. Thus, this thesis contributes to the existing literature by extending the discussion about a system view approach to health promotion initiatives. Drawing on relevant and allied research on a multiple level approach in addressing health and well-being of individuals.

Figure 3: Regional map of Ghana (prior to creation of new regions in 2019) with poverty incidence



Organization of The Study

This thesis is organized into six chapters. Chapter one introduced and set the background for the study into the dynamics of women's ability to negotiate safer sex, including study objectives, rationale, and main research problems.

Chapter two begins with drawing on theoretical perspectives, including antecedent conditions that are directly and contextually associated with women's ability to negotiate safer sex. Through such efforts, the role of comprehensive knowledge of HIV/AIDS, gender role attitudes of women and their economic status are identified as essential factors. Accordingly, the integral theory is advocated as an appropriate theoretical framework to integrate the identified elements in theoretically meaningful ways that illustrate a multilevel understanding of the enablers and restraints of women's sexual lifestyle choices.

Chapter three takes stock of relevant and allied academic literature on sexuality and HIV/AIDS prevention to engage in literature synthesis, gap identification and develop hypotheses that are grounded in both the theoretical and methodological caveats plaguing the research field. Differently stated, a combination of relevant literature in this chapter guides the overall research model of this thesis, which is examined in the chapter that follows.

Chapter four details the appropriate methodological choices necessary to investigate the outlined research model. Accordingly, the philosophical foundation, research design, data structure, and analytical estimation procedures utilized are discussed in this chapter. Issues about moderation and ordered categorical multilevel analysis are discussed in detail.

Chapter five presents the results from data analysis and the inferences associated with the hypotheses outlined in chapter three. The results include the descriptive statistics, correlations (Pearson and Polychoric), and multilevel modelling estimates.

Lastly, chapter 6 presents a more in-depth discussion section. It entails discussions about the study finding, implications for research and practice, thesis limitations, and directions for future health promotion research. A general conclusion ends the chapter.

CHAPTER TWO: THEORETICAL FRAMEWORK

Introduction

In this section, I begin with identifying the streams of antecedents that are associated with the sexual decision making of women and theories used in guiding these streams. Next, I present the theoretical framework for this thesis.

Theoretical frameworks in HIV/AIDS Prevention

Extant literature points out at least four streams of determinants in HIV prevalence within a heterosexual context; biological, sexual behaviour, socio-cultural and structural factors (Amaro, 1995; Krishnan et al., 2008). The four streams that contribute to the epidemiology of HIV/AIDS form the two levels – individual and collective - which underpin the approaches for HIV/AIDS intervention (Aral, Holmes, Padian, & Cates, 1996).

Individual Level Determinants

The biological perspective expounds that anatomical and physiological differences and genetic susceptibilities and immunities associated with being biologically female can affect health outcomes (Türmen, 2003). For example, Lande (1993) in a study found support for this perspective. Thus, just one exposure can put women at risk, at least twice as likely as their men counterparts to sexually transmitted infections. Likewise, in the context of sexual behaviour (e.g., the number of sexual partners, concurrent partners) stream which traditionally has dominated the HIV/AIDS literature provides substantial evidence to explain a part of the differing prevalence of HIV/AIDS (Coates et al., 2008). For example, a study by Clark (2004) in the sub- Sahara context found that the partners of married girls are likely to be three times infected given that their partners are likely to have multiple partners, putting married girls at risk.

Psychosocial theories such as Health Belief Model (Becker, Maiman, Kirscht, Haefner, & Drachman, 1977), Theory of reasoned action (Fishbein, Jaccard, Davidson, Ajzen, & Loken, 1980) have been utilized under individual level interventions. These theories traditionally assume that sexual risk behaviour is an outcome of individual decision making (Kalipeni, Oppong, & Zerai, 2007; Rotheram-Borus, Swendeman, & Chovnick, 2009; Waldo & Coates, 2000). Hence such theories have focused on reducing the number of sexual partners, practise abstinence, use of condoms during sexual encounters, and the treatment of STDs among those viewed as at higher risk of HIV/AIDS. While these strategies to prevent sexual transmission of HIV/AIDS is useful

and well defined, its implementation is a challenge (Cohen, 2007). Indeed, the complexity of sexual behaviour has made their effectiveness limited and anecdotal (Catania, Kegeles, & Coates, 1990; Gómez & Marin, 1996). Although these theories have played an essential role in shaping HIV prevention, these models are critiqued for the 'silo' thinking approach about sexual behaviours (e.g., Kelly, Zyzanski, & Alemagno, 1991). In part, the limitation of these theories has been the narrow focus on the individual with a lack of appreciation for the broader cultural and social context of sexuality (Coates et al., 2008).

Collective Level Determinants

Socio-cultural and Structural factors accumulate to influence the adoption of a healthy behaviour. Some scholarship discourse points to the influence of social environment in other to prevent the infection of the HIV/AIDS virus (Amaro, 1995; Coates et al., 2008; Norris, Masters, & Zawacki, 2004). For example, perceived social norms which are related to gender role attitudes are discussed in the literature as an obstacle to HIV/AIDS/ prevention (Kasen, Vaughan, & Walter, 1992). Structural factors, on the other hand refers to all risk factors that impinge upon the immediate setting by acting as external stressors or buffers (e.g., socio-economic and employment status.) on the likelihood of an individual engaging in a risky behaviour (El-Bassel et al., 2001). Theories such as gender and power (Connell, 2013), social cognitive theory (Bandura, 1986) AIDS Risk Reduction Model (Catania et al., 1990) have been utilized under this stream. For example, gender and power theory depicts the social structural (i.e., the sexual division of labour, power, and structure) characterized in a gendered relationship between men and women (Wingood & DiClemente, 2000). Within the framework of economic bargaining theory, one underlying proposition that limit women's ability to negotiate for themselves is their economic status (Beegle et al., 2001; Quisumbing & Maluccio, 2003).

Indeed, while these theories may appreciate the behavioural and social environment in which HIV prevalence varies, little consideration is given to the interaction between the individual and the collective factors (Amaro & Raj, 2000; Coates et al., 2008). That is, the exterior complexity of social systems and human behaviour, and the interior complexity of culture and psychology are examined independent of individual factors. Even though the issue of when and for what purpose theories are developed is an important consideration there is currently no convergence as to which HIV/AIDS behavioural theory is most precise in predicting HIV risk behaviour (Noar, Benac, &

Harris, 2007). To this end, how do these dimensions serve the current needs of those at risk of HIV infection?

With so many mechanisms at play and several focused perspectives under study (e.g., cognitive ability, gender, the role of partner, socio-economic barriers), a synchronization on how it all might fit together in meaningful ways is, thus, imperative. Indeed, Amaro and Raj (2000) suggest an integration of both these individual and collective factors within which women negotiate for safer sex. Drawing on the extant literature and grounding in empirical evidence where available, this study seeks to develop a model that explicates the mechanism to HIV/AIDS prevention. To this end, I draw on extant theories to conceptualize a map of interactions of the antecedents of women's ability to negotiate for safer sex. Hence, Ken Wilber's Integral Model is adopted.

The Integral Theory

Ken Wilber's Integral Model presents a holistic framework to upgrade a conceptual understanding of gendered differences in HIV prevalence by drawing on the interaction of the several theoretical perspectives underpinning the causality (Esbjörn-Hargens, 2010). As defined by Wilber, integral theory is "comprehensive, inclusive, balanced, and not leaving anything out" (cited in, Esbjörn-Hargens, 2010 P.46). The theory draws on multiple sources of knowledge about a phenomenon. That is a conceptual framework that allows already existing separate paradigms to have emerged into an interrelated network of approaches that are jointly enriching (Lundy, 2010). The outcome is a map of reality that incorporates both subjective and objective dimensions of life, individuals as well as collective contexts. The model provides an overarching framework to appreciate the interconnectedness of mechanisms that collectively impact gendered differences in HIV prevalence (Brown, 2010). The model maps four irreducible dimensions referred to as the four quadrants and the four basic pronouns represent each of the four quadrants: "I", "WE", "IT", and "ITS." the quadrants based on two dimensions: exterior-interior and individual-collective (Esbjörn-Hargens, 2010).

An underlying assumption of the integral theory is the interconnectedness of the four quadrants (Lundy, 2010). The interplay of the four-quadrant can serve as a framework for a holistic examination of the antecedents of women's ability to negotiate safer sex. To exemplify this, Brown et al. 2010 draws on the four quadrants to illustrate how the four levels of causation fit into the

quadrants and the interrelationships that exist both at the individual and collective level. Figure 4 illustrates the integral map of Lundy (2008) which categorises determinants of health well-being and healthy human development based on Wilber's Integral Model (cited in Lundy, 2010).

Figure 4: Determinants of health, Well-being and healthy Human development, An Integral Map

The I - Quadrant is focused on the 'inner individual' and emphasizes the emotions, self-identities, increased self – awareness and emotional intelligence and beliefs of the individuals in relation to health and wellbeing. This quadrant lays out a framework about how the individual's behavioural aspects related to HIV prevention or treatment. Drawing on behavioural theories that explicate individuals change in behaviours as an antecedent to HIV prevention efforts worldwide (see, Sohl & Moyer, 2007 for an overview).

The IT – Quadrant (outer individual) focuses on healthy action (i.e., risk-taking, ability, action, and skills) are exemplified factors contributing to the gendered difference through behavioural and physiological analyses. The literature acknowledges the dyadic nature of HIV risk behaviour (Fisher & Fisher, 1992; Noar et al., 2007; Noar, Morokoff, & Redding, 2002). Sexual behaviour is unique in that it requires two people to make their health decision. Noar (2007) posits the

categorisation of these skills to include the ability to negotiate safer sex (i.e., abstinence and condom use).

The WE – Quadrant of the integral model explores a constellation of social problems in the form of philosophical, ethical, and religious viewpoints of the community around the individual through cultural and worldview investigations. Theories of agency (e.g., Kabeer, 2005) and empirical studies (e.g., O'leary, Goodhart, Jemmott, & Boccher-Lattimore, 1992; Pulerwitz, Gortmaker, & DeJong, 2000), provides supported factors that can indirectly influence health-related behaviours such as the ability to negotiate for safer sex.

Under the ITS Quadrant, it examines the environmental, political, educational, legal, and economic factors that contribute to the situation through an ecological and social assessment. Such structural pathways characterise the lack of access to critical information and health services for HIV/AIDS prevention and limited access to formal education and skill development (Kabeer, 1999, 2005).

Acknowledging that, the integral theory encompasses “everything”, this study is restricted to the four quadrants – precisely healthy mind (comprehensive knowledge of HIV/AIDS), Healthy action (ability to negotiate safer sex), healthy culture (gender role attitudes) and healthy systems (economic status).

CHAPTER THREE: LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Introduction

In this section, I review relevant existing literature and develop a hypothesis about factors affecting women's ability to negotiate safer sex over and above the importance of comprehensive knowledge of HIV prevention. Next, I present the theoretical framework for this thesis to complete the chapter.

Literature Search Strategy

An electronic search for academic articles containing the terms "ability to negotiate safer sex" ''gender role attitudes'' '' economic status'' ''married women'' and "comprehensive knowledge on HIV/AIDS" from the PubMed, Biomed Central and PsycInfo, databases were conducted through the authors' university library system. Regarding the exclusion and inclusion criteria, the study only considered published peer-review papers because of their inherent higher quality as compared to unpublished papers. Eliminated papers were those not published in English. However, there was no limitation on the year of publication. To widen the search, using the Boolean phrase keywords like social norms, couples, partners, or dyad, sexual communication in quotation marks were included. A manual check in the reference lists of retrieved studies augmented the database searches.

All articles that were considered for inclusion had to meet the following criteria to be included in the review: (1) The authors had to address at least one of the determinates of ability to negotiate safer sex. (2) The focus of the study should be heterosexual women. The combination of search results filtered by the outlined inclusion and exclusion criteria and elimination of duplicates were synthesised to identify the interconnection of predictors of women's ability to negotiate safer sex.

Review Synthesis: Emerging Issues, and Gap Identification

Increasingly, women's ability to negotiate safer sex has generated much interest and continue to dominate the HIV/AIDS prevention discourse. In at least one meta-analysis by Noar et al. (2006), the authors articulated the need for more research on safer sex negotiation. Despite this growing literature on the ability to negotiate safer sex, several fundamental questions remain. For instance, what is the magnitude of the interaction between the individual level and the collection level on the ability to negotiate safer sex in relation to a possible moderation effect in this interaction? Indeed, contemporary discourse calls for attention to a holistic approach due to the complexity of

the phenomenon (e.g., Amaro, 1995; Coates et al., 2008; Waldo & Coates, 2000). Indeed, everything seems to be connected to everything in some way and considering the complexity of the health processes, a system view approach is appropriate (Mittelmark, Wold, & Samdal, 2012). Albeit, there is a dearth of studies that observes the aggregate effect of radical and sustained behavioural changes on individuals potentially at risk for a successful reduction in HIV transmission. Thus, not many studies have examined the cumulative effects of comprehensive knowledge on HIV/AIDS prevention as a predictor, gender role attitudes as a contextual factor on the ability to negotiate safer sex as an outcome variable. For instance, a number of studies (De Coninck, Feyissa, Ekström, & Marrone, 2014; Edgar, Freimuth, Hammond, McDonald, & Fink, 1992; Tenkorang, 2012; van der Straten, Catania, & Pollack, 1998) have examined individual-level determinants regarding the ability to negotiate safer sex. Some studies (e.g., Atteraya, Kimm, & Song, 2014; Chai, Sano, Kansanga, Baada, & Antabe, 2017; Holland, Ramazanoglu, Scott, Sharpe, & Thomson, 1992; Pulerwitz & Dworkin, 2006; Sunmola, Mayungbo, Fayehun, Opayemi, & Morakinyo, 2018) have also examined the antecedents of the ability to negotiate safer sex at the collective level. While some previous studies (e.g., Amoyaw, Kuuire, Boateng, Asare-Bediako, & Ung, 2015; Curtin, Ward, Merriwether, & Caruthers, 2011; Rivers et al., 1998) have also examined both levels in the same study but what is still missing is the interaction effect at both levels.

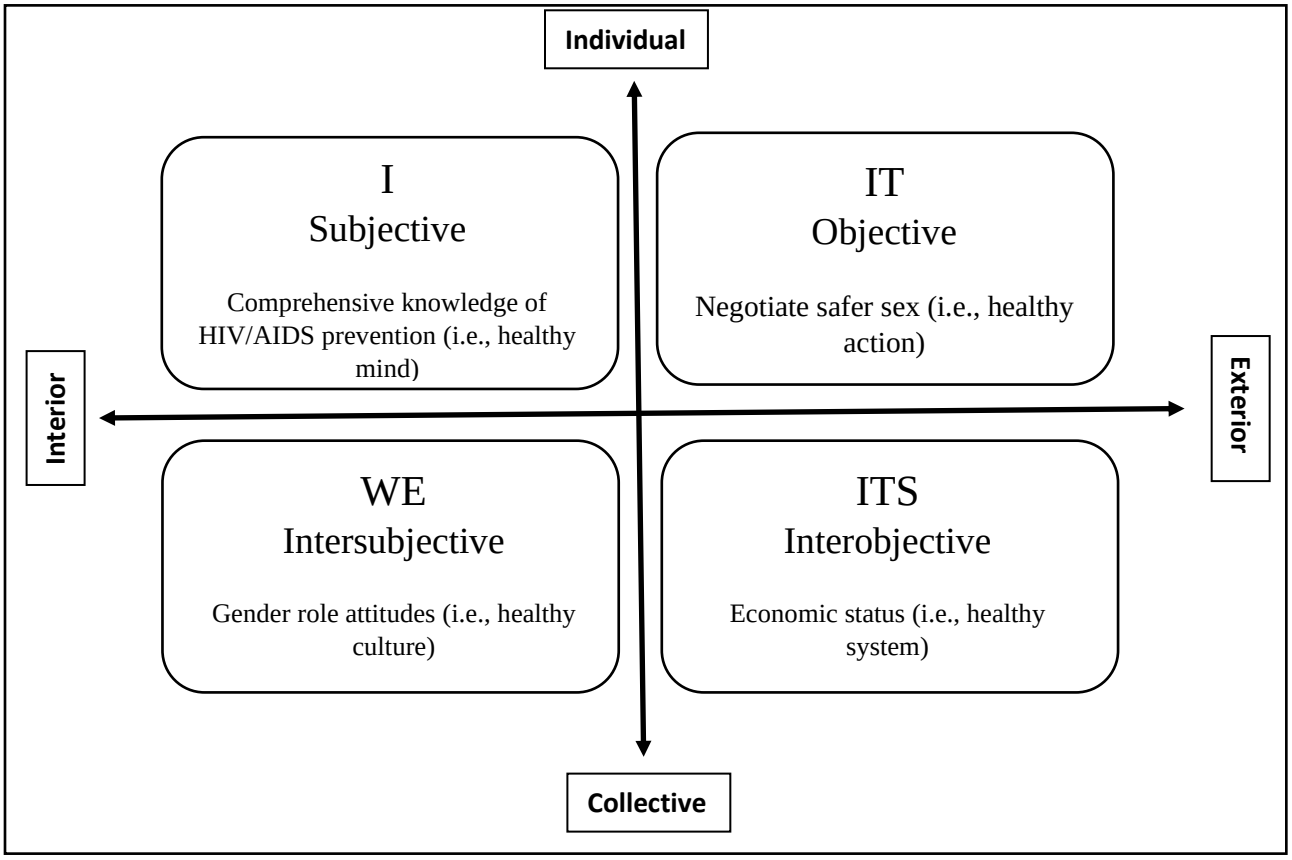
However, in at least one study Wang, (2013) that examined the interplay between the individual and collective levels, gender at the collective level was examined as the differences between gender, rather than differences within gender. As such this thesis contributes to the literature by empirically investigating gender based on gender perspective rather than sex difference to provide empirical support to the interplay of individual and collective determinants that constraints married/cohabiting women ability to negotiate safer sex.

Theoretical Model for The Study

Focusing on women's ability to negotiate for safer sex, this thesis conceptualizes a model (Figure 5) according to each of the quadrants to provide a coherent view of the subjective and objective dimensions that can be tested. The four documented irreducible perspectives exemplify the methodologies that different school of thought uses to study the phenomenon. To generate a more in-depth analysis and bringing renewed attention to all the factors that influence women's ability to negotiate safer sex and the interconnections. Accordingly, this study seeks to theorize and test

a model that explicates the contextual role of gender role attitudes and economic status on the effect of comprehensive knowledge of HIV/AIDS on the ability of women to negotiate safer sex in other to reach some conclusion on the fundamentals of HIV prevention needed.

Figure 5: Integral Theory Dimensions in the Study of Women's ability to Negotiate safer Sex



Literature Review: Predictors of Ability to Negotiate Safer Sex

The I Quadrant – Healthy mind (Comprehensive Knowledge of HIV/AIDS)

The relationship between correct knowledge on HIV transmission and prevention and the ability to negotiate for safer sex is well documented and deemed vital in avoiding HIV infection (Acitelli & Antonucci, 1994; Adih & Alexander, 1999; Lande, 1993). Indeed, a crucial pre-requisite for creating an HIV/AIDS-free generation is the improvement in the levels of knowledge of HIV transmission and prevention (Grossman & Stangl, 2013; Sales, Milhausen, & DiClemente, 2006). Empirical studies (e.g., Amoyaw et al., 2015; Rivers et al., 1998; Tenkorang, 2012; van der Straten et al., 1998) utilizing cognitive behaviour theories found support for a positive relationship between comprehensive knowledge of HIV/AIDS and the ability to take a healthy action (i.e.,

ability to negotiate for safer sex). As such, an increase in knowledge can contribute to taking the required action to prevent health problem. The perception people have about their susceptible to HIV/AIDS the likely to protect themselves from the sexual transmission of the disease by using a condom. Such preventive efforts inherently assume individuals have some basic knowledge of HIV/AIDS. Scholars studying the antecedents of ability to engage in a healthy action seems to support the link between belief about the chances of contracting a health condition and a range of preventative health measure and its overall effect on health outcomes (Coates et al., 2008; Rosenstock, Strecher, & Becker, 1994). That is, the value placed in a specific outcome (e.g., prevention of HIV/AIDS) by a person and the individual's estimation of the likelihood that a specific action (e.g., consistent condom use) will provide that outcome, will influence behaviour. A meta-analysis by Crepaz and Marks (2002) support the association between perceived susceptibility and HIV/AIDS transmission.

Although interventions derived from behavioural science has contributed to the HIV prevention successes, the predictive power seems insufficient when used by themselves to produce substantial and lasting reductions in HIV transmission between individuals or entire communities (Coates et al., 2008; Green et al., 2015). In general, there is a belief that individuals will take action to prevent health conditions if they assume themselves as susceptible to the condition.

IT Quadrant – Healthy action (Ability to negotiate safer sex)

HIV preventive behavioural theories such as AIDS risk reduction model (Catania et al., 1990) and Information-Motivation-Behavioural Skills (Fisher & Fisher, 1992) has long acknowledged the importance of negotiating safer sex given the need for communication between partners. One dimension of ability to negotiate safer sex as conceptualized by Quina, Harlow, Gibson, and Morokoff (1990) involves ability, to discuss or insist upon contraceptive and condom use with a partner or refuse sex. Thus, ability to negotiate for safer sex becomes imperative as women do not only require the skills but the confidence to engage in this healthy action (Noar et al., 2006)

As discussed in quadrant I, psychosocial factors such as knowledge, attitudes, beliefs, intentions, and personality traits influence healthy action and hence their interconnectedness. Janz and Becker (1984) finding shows that susceptibility predicted behaviour better for prevention behaviour than treatment. For example, women will be willing to negotiate for safer sex based on their susceptibility beliefs. However, the authors argued that the relationship would be weaker in a

cross-sectional study than the relationships in a longitudinal study. Again, in a meta-analysis, Carpenter (2010), asserts that the direct effects of the predictor on behaviour is not recommended even though it remains tentative due to the small number of studies. Concerning the relationship between comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex, empirical evidence based on a review of studies relating mainly to married women seems to support a positive association (Amoyaw et al., 2015; De Coninck et al., 2014; Ung et al., 2014). For instance, Vyas (2019) study showed that women would refuse sex with their partners on suspicions about men's behaviour combined with accurate HIV knowledge. To this end, evidence still supports the existence of a direct positive relationship between comprehensive knowledge and the ability to negotiate safer sex. Hence, I hypothesize that:

> H1: Comprehensive knowledge of HIV/AIDS prevention is positively related to married/cohabiting women ability to negotiate safer sex.

Contextual Mechanisms Affecting Married Women's Ability to Negotiate Safer Sex

We Quadrant – Healthy culture (Gender role attitudes)

Thus far, I have suggested that comprehensive knowledge of HIV/AIDS is positively related to the ability to negotiate safer sex based on the existing literature. However, results of some studies (e.g., Awusabo-Asare et al., 1993; Kalichman, Williams, Cherry, Belcher, & Nachimson, 1998; Kordoutis, Loumakou, & Sarafidou, 2000) found that cultural and subcultural norms such as subservient gender role attitudes, influence women's sexual HIV-risk behaviour. Hence cultural factors may weaken women's ability to negotiate safer sex; thus, emphasis must be paid to cultural norms and the social interactions around sexual activity.

Hypothesising gender role attitudes as a moderator may dilute the effects of comprehensive knowledge of HIV/AIDS on the ability to negotiate safer sex. The concept gender role attitudes are not biologically given but instead a construct based on what society considers appropriate for both male and female (Theobald, Tolhurst, & Squire, 2006). As such, cultural values and norms at least influence, and sometimes define, the sexual behaviour of men and women (cited in, Amaro, 1995). More broadly, gender role attitude results from early gender socialization, that sharp the sexual behaviours for both men and women and therefore has ramifications across the life course of people (Marmot et al., 2008). For example, one outcome of such gendered roles differentials is

evident in childhood development practice, where in conflict resolution women and men must use different styles. Boys are expected to use physical dominance and girls to use verbal persuasion; with the possibility of placing girls at a disadvantage in such situations (Amaro, 1995).

HIV/AIDS interventions have traditionally relied on women ability to require their sexual partner to either use a condom or engage in non-penetrative sex which is a non-traditional behaviour in some cultures. For instance, Gómez and Marin (1996) study reported that, where women had suggested condom use or refuse to have sexual intercourse, their partners would be angry or possibly even be violent. According to Amaro (1995), women may, therefore, be less able to avoid the sexual behaviours that place them at risk for HIV infection.

Gender role attitudes latterly have become an antecedent in negotiating for safer sex. Indeed Amaro (1995) asserts that gender is imperative in women's ability to negotiate for safer sex. Some scholarship discourse (e.g., Jewkes & Morrell, 2010; Krishnan et al., 2008) has helped elucidate the role gender plays as a barrier to safer sex behaviours among women. In an inductive qualitative study by Noland (2006) in Puerto Rico, found that gender significantly affects the ability to negotiate for safer sex. Despite the substantial evidence that has been found to support the relationship between gender role attitude and ability to negotiate for safer sex, its impact, according to Michalos (2014), is apt to be indirect.

Hence, a woman with more subservient gender role attitudes. may reverse the magnitude of the effect of comprehensive knowledge on HIV/AIDS prevention on the ability to negotiate for safer sex. In Carpenter (2010) meta-analysis, he asserts that examination of the percentage of variance explained by artefacts and other sources of error indicates that moderators of these effects are very likely. Hence Carpenter (2010) suggests models that examine possible moderation among the variables. Wang, (2013) empirical studies suggest gender as a potential moderator for future studies. Following the same pattern of reasoning, this study develops a similar proposition for the direction of the relationship of gender role attitudes and ability to negotiate for safer sex. Hence, I hypothesize that this contingency factor shapes the relationship between comprehensive knowledge of HIV/AIDS and the ability to negotiate for safer sex;

> Hypothesis 2: Gender role attitudes moderate the relationship between comprehensive knowledge of HIV/AIDS prevention and the ability to negotiate safer sex such that the

relationship is weaker for married/cohabiting women with more subservient gender role attitudes.

ITS Quadrant - Healthy system (Economic status)

This thesis posits that, the collective interior – We quadrant may influence the relationship between the individual interior – I quadrant and the individual exterior. The discussion is extended to include the potential influence of the collective exterior – ITS Quadrant. Thus, the ITS quadrant (i.e. economic status) may also interact with comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex. Economic status (e.g. poverty) often referred to as one of the social determinants (Marmot, 2005) is likely to limit a women's ability to take a healthy action (Coates et al., 2008; Kabeer, 2005; Krishnan et al., 2008). Entrenched economic inequities are driving the globally expanding female HIV/AIDS epidemic (Coates et al., 2008). Poverty is manifested in the form of insufficient income, restrictions in educational attainment and access to labour markets, and minimized decision-making autonomy (Kabeer, 1999, 2005; Marmot, 2005). Barnett and Parkhurst (2005) found that sex is more likely to be tied to livelihoods for people in the poor income group than the case for rich societies. A study by Machel (2001) in Maputo, Mozambique found that, while gender dynamics work against women in totality, middle-class young women have a potential advantage in sexual negotiation than working-class counterparts. The study reported that, middle-class young women had fewer sexual partners, used condoms more often and seemed likely to challenge gender norms and were more assertive. However, Vyas (2019) qualitative study showed that, perceive paid working did not give women higher sex negotiation power. Amidst the level of evidence, this study posits a moderating role of economic status. Hence, I hypothesize that:

H3: Economic status moderates the relationship between comprehensive knowledge of HIV/AIDS and married/cohabiting women ability to negotiate safer sex such that the positive relationship is stronger with rich married/cohabiting women than the not-rich group.

Other Factors Affecting Women's Ability to Negotiate Safer Sex

In this study, it is hypothesized that contextual variables (i.e., gender role attitudes and economic status) will have the most significant impact on married/cohabiting women ability to negotiate safer sex. This thesis also recognizes that other background characteristics may exert some distal effects. There is evidence for background variables such as the role of ethnicity, religion, number

of other wives, age, place of residence educational level playing some role in affecting women's ability to negotiate safer sex, hence these variables are discussed.

Ethnicity and religion

Religious beliefs and ethnic affiliation could significantly influence an individual's ability to adopt a healthy action. Women who belong to religious groups that turn to place emphasis on women to be submissive to their partners are less likely to be able to negotiate for protective sex. For example, in Zimbabwe, safer sex negotiation by women with their partners was openly discouraged by religious leaders' (Mugweni, Omar, & Pearson, 2014).

Studies on ethnicity and religion contain mixed evidence regarding the significant effects of these variables on women's ability to negotiate safer sex. For example, Tenkorang (2012), in a study after controlling for wealth, age, education, place of residence, ethnicity, and religion found no significant effect of ethnicity and religion. However, in similar study investigators have linked ethnicity group, religious affiliation to the ability to negotiate safer sex (see, Chai et al., 2017; Wang, 2013 for a review).

Level of education

The effects of education level on women's ability to negotiate safer sex are fragmented. Sarpong (1977) suggest that, given the cultural roles, married women are expected to play in the Ghanaian context, the level of education may not influence their ability to negotiate safer sex. However, recent studies in other context provide contrary evidence when the level of education is used as a control variable (Chai et al., 2017; Sano, Sedziafa, Vercillo, Antabe, & Luginaah, 2018; Wang, 2013)

Marriage type

Traditionally, women who found themselves in the sub-Sahara region face the incidence of their partner having another partner often term as polygyny. Thus, only a man can marry more than one wife in a customary marriage. Evidence from a qualitative study by Mtenga, Geubbels, Tanner, Merten, and Pfeiffer (2016) seems to suggest that, women in polygamous relationships were not interested in safer sex since they were not sure of the sexual behaviours of other wives. The

marriage type is of importance since they reflect and shape the marital context, within the safer sex discourse, and how that can contribute to the vulnerability of women to HIV/AIDS.

Age

In the sub-Sahara region, anecdotal evidence suggests age may contribute to women's inability to negotiate safer sex. Partly been attributed to a higher status, power and assertiveness associated with older males which may influence the ability of the younger female partner ability to negotiate for safer sex (Gómez & Marin, 1996; Jewkes & Morrell, 2010). In terms of empirical evidence, Sano et al. (2018), study found a positive association between age and ability to negotiate safer sex. However, Tenkorang (2012) study in ghana did not found any significant effect of age on a woman's ability to negotiate safer sex.

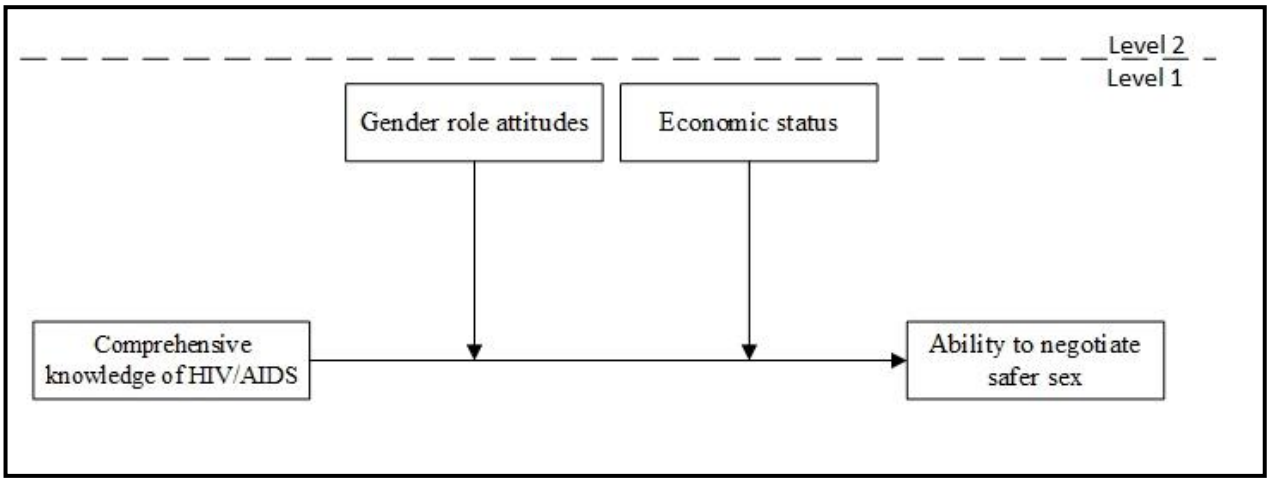
Rural-urban effects

The relevance of place of residence in a woman's ability to negotiate safer sex is well acknowledged in the literature. Women who reside in rural areas where traditional norms are strictly conformed to are less likely to negotiate safer sex. In at least three studies (Chai et al., 2017; Sano et al., 2018; Tenkorang, 2012) in African countries where the place of residence is used as a control variable, being an urban resident predicted more ability to either ask a partner to use a condom or to refuse sex compared to rural residency.

Overall Research Model (Summary)

This study adopts the integral theory to develop a theoretical model that explains the contextual factors (i.e., gender role attitudes and economic status) affecting the relationship between comprehensive knowledge of HIV/AIDS married/cohabiting women's ability to negotiate safer sex as shown in Figure 6. Based on the mixed results of existing research, the possible moderating role of gender role attitudes and economic status in Ghana is examined to inform the development of effective health promotion interventions. Other control variables such as age, ethnicity, religion, place of residence educational level and several other wives that are potentially associated with married/cohabiting women's ability to negotiate safer sex in Ghana are also examined. Considering the importance of the interplay of individual and collective determines an individual's ability to adopt a healthy action, this study may provide valuable knowledge for health promoters and other practitioners to improve their programmes and services primarily in HIV/AIDS Prevention among married women.

Figure 6: Multilevel Research Model



Notes: level 1 denotes individual level variables whiles level 2 denotes household cluster

CHAPTER 4: METHODS

Introduction

Based on the research hypotheses outlined above, this chapter details the appropriate methodological choices necessary to complete this research. Accordingly, the philosophical foundation, research design, data, and the analytical approach adopted for the study, are described and discussed.

Philosophical Foundation

The philosophy of science positions the research paradigm within which a researcher sees the world, the underlying assumptions, and the research strategy as well as methods (Krauss, 2005). This thesis adopts the positivist philosophy of science. In social science research, Positivist Social Science remains one of the dominant research paradigms and predominantly subsumes quantitative research methods. Positivism is a scientific framework for acquiring knowledge about a phenomenon through causation and effect (Crossan, 2003). Neuman defines Positivist Social Science as "an organized method for combining deductive logic with precise empirical observations of individual behaviour to discover and confirm a set of probabilistic causal laws that can be used to predict general patterns of human activity" (2013, p. 95). This inquiry is expected to establish and offer explanations on the cause and effect of human actions. The process of establishing these laws is underpinned by physiological assumptions that show the interrelationship between the nature of reality to be examined, what can be known, and how that can be known (Hudson & Ozanne, 1988). To uniquely distinguish positivism from other research paradigms (i.e., constructivism and interpretative), and the basis for this philosophical position, the underlying ontology, epistemology, and methodologies are discussed.

The underlying ontology, as defined by Neuman (2013, p. 92), deals with what 'reality' is and its underlying fundamental categories. Positivist Social Science assumes a realist view of the world exit. That is, there can be a direct relationship between what we observe and what occurs. Punch, explains this realist view as an objective account of the world can be given, and that the function of science is to develop a descriptive and explanations in the form of universal laws (2013, p. 31). In this thesis, a critical assumption made is that the relationships between variables of interest can be expressed in terms of equations and estimated. Thus, positivist philosophy is appropriate and followed.

In terms of Positivist Social Science, the epistemology–scientific lenses through which the truth can be seen (Krauss, 2005) – is assumed to be deterministic, and laws of cause and effect are discernible. Positivists take a generalized approach to research.; that is, they seek out general, abstract rules that ideally applies to an infinitely large number of phenomena, people, settings, and times (Hudson & Ozanne, 1988). There is a reliance on causal laws and the interrelationship between statements — for instance, the relationship between knowledge of HIV prevention and one's ability to negotiate for safer sex. In summary, this thesis utilized a quantitative approach.

Research Design

The research design involves the basic framework for an investigation to address the research hypotheses. The design also guides the researcher in addressing issues such as the technique for data collection, the sampling methods, the cost involved and the time required for the research, the techniques to be used in data analysis (Creswell & Creswell, 2017; Punch, 2013, p. 114). Generally, a good research design minimizes bias. It maximizes the reliability of the data collected and analysed while ensuring coherence and fit to research purposes, conceptual and theoretical framework (Punch, 2013, p. 114).

The design used in this thesis is cross-sectional and drawing on secondary data from the 2014 Ghana Demographic and Health Survey (GDHS). This design is adopted to try to determine whether there is a statistically significant relationship between the variables as stated. Cross-sectional studies are useful at identifying associations that can lead to further studies in similar or related directions using a cohort study or randomized controlled study (Mann, 2003). A significant interest in public health research is the applicability of study findings to an unobserved population (Polit & Beck, 2010). As such, it provides a systematic and evidence-based perspective that can be applied to different geographical settings and people outside of the context studied.

Ghana Demographic and Health Survey-2014 Dataset

The dataset is sourced from the Measure Demographic and Health Surveys (DHS) project established by US Agency for International Development (USAID). The programme was established in 1984 with the objectives of providing data and analysis to cover development issues such as health and population, nutrition of women and children in developing countries (Croft, Marshall, & Allen, 2018). Since its inception, the DHS has been involved in conducting more than

400 surveys in 90 countries throughout the world (see[1] for a comprehensive overview). The Ghana Demographic and Health Survey (GDHS) collected in 2014 is the primary source for analyses in this thesis.

GDHS a nationally representative dataset is administered by the Ghana Statistical Service and the Inner City Fund International and the 2014 wave marks the sixth in such surveys of the GDHS Program (Ghana Statistical Service - GSS et al., 2015). The surveys are designed to obtain national and sub-national data on key program-related indicators such as knowledge, attitudes, and behaviours related to HIV/AIDS, women's status, fertility, family planning, reproductive and child health. Key indicators on socio-economic and demographic characteristics of the households and individual respondents are also collected (ibid). The 2014 dataset is the most recent DHS data from Ghana available for the study objectives.

Data

Sampling Technique

The Survey selects a random sample of clusters (usually villages or urban blocks) from a national sampling frame, using mostly the most recent national population census (Croft, Marshall, & Allen, 2018). Before the survey a full listing of all households is within the selected clusters is made, and then households are drawn base on systematic random sample. The final DHS Data matched three questionnaires: a household questionnaire, a woman's questionnaire, and a man's questionnaire.

Given the primary objective of the survey and the indicators available, the 'Woman's Questionnaire Forms' is the focus for the purpose of this thesis (See Croft, Marshall, & Allen, 2018). During the primary fieldwork, women age 15–49 and men age 15–59 (age cut-offs for men vary by survey) who are either permanent residents of the households in the sample or guest present in the household on the evening prior to the survey are eligible to be interviewed in the survey. A sample of 9,396 women age 15-49 in all selected households and 4,388 males between the ages 15 to 59 in half of the selected households were interviewed with a response rate of 97% for women and 95% for men (Ghana Statistical Service - GSS et al., 2015).

[1] See, https://dhsprogram.com/ for an overview

Study Population

A Couples Recode Unit of analysis dataset is accessed from the DHS 2014 database. The data contains completed individual interviews from couples, (men and women individually) who declared to be married or living together and completed individual interviews. This dataset is the result of linking the women-only files and men-only files by couples ID. The data takes accounts of polygynous settings; man's data are linked to more than one woman's data. For the purpose of this study, the sample was restricted to currently married/cohabiting women aged 15–49 who answered questions on the ability to refuse sex and to ask for condom use with their husband, using the couple dataset.

Data Quality Assurance

The following reasons seem to suggest that the DHS data is of high quality and can accurately measure specific phenomena. There is an extensive data editing operation as well as imputation procedures to deal with incomplete reporting of dates of important events in the respondent's life (Croft, Marshall, & Allen., 2018). Indeed, data quality assessment reports conducted over the period have also confirmed it to be of high quality (Pullum, 2019). Also, misreporting of ages, which have the potential of affecting many of the indicators in the surveys, can be taken care of given the age range for eligibility (Pullum & Staveteig, 2017). For quality assurance purposes, a detailed procedure on data collection and analysis is available (see[2] for a comprehensive view on data quality).

Data Access and Authorization

Permission and the data were provided to the author upon a successful request application detailing the purpose of use and research questions to be examined. The author of this thesis is bound to share a copy of the thesis with the department responsible for granting data access. Permission to use the dataset for academic purposes was approved on 28th January 2019 (see, Appendix A, for approval details). Generally, the DHS data is collected to be publicly available. See their website[3] for exact information on this.

[2] https://www.dhsprogram.com/data/Data-Processing.cfm#CP_JUMP_5191
[3] https://dhsprogram.com/

Measures

This section details the GDHS variables used and how the scale items were treated and handled to form composite variables for analysis.

Ability to negotiate safer sex: It assessed the extent to which a woman can negotiate safer sex. Guided by Croft et al. (2018), this variable is measured on a binary response to whether (i) she can refuse sex or (ii) request condom use if she knows that her husband has an STI. These two sub-dimensions were collapsed into three categories in the final analysis. That is, the response was recoded with zero (0) representing no to both i and ii, one (1) for yes to either i or ii and two (2) for yes to both items. See Appendix B for detailed description of the index.

Comprehensive knowledge of HIV/AIDS: It is an index of five self-reported items and reflect a measure of woman's comprehensive knowledge of HIV/AIDS according to the DHS guidelines (see, Croft et al., 2018, p. 13.12 for a comprehensive overview). These five items reflect two sub-dimensions of comprehensive knowledge of HIV/AIDS: 1) Knowledge of HIV Prevention Methods and 2) Local misconceptions (Risk Perception of Contracting HIV) about HIV/AIDS transmission or prevention. Sample items are "always use condoms during sex", having sex with partner only, who has no other partners "Mosquito bites cannot transmit HIV", "HIV cannot be transmitted by supernatural means" and "A person cannot become infected by sharing food with a person who has HIV". Each of these items was scored with one (1) if the woman said yes to the item and zero (0) if the woman said no to the item. The *don't know* response was recoded as Zero (0). These items were scored and summed such that higher scores indicate higher *comprehensive knowledge of HIV/AIDS*. See Appendix C for detailed description of the index.

Economic status: The wealth index factor is used as a measure of economic status. The wealth index factor is calculated as the fraction of nine assets or amenities (radio, television, refrigerator, bicycle, motorcycle, car, telephone, electricity, and a (toilet or pit latrine) that the respondent's household has (Croft et al., 2018). Studies that have utilized this index in the sub-Sahara region include (Asaolu et al., 2018; Rustein & Johnson, 2004; Tenkorang, 2012). The wealth index was dichotomized to group married/cohabiting women into rich (i.e., rich, richest) and not rich (poor to the middle). The aim was to observe how women considered being in the rich group may be associated with more power that influences their ability to negotiate safer sex.

Gender role attitudes: Following the Guide of DHS statistics (Croft, et. al., 2018), the attitude towards wife-beating is an index of five self-reported items and were used as a proxy of gender role attitudes. Sample items include "beating justified if wife argues with husband," "beating justified if wife neglects the children," "beating justified if the wife goes out without telling husband," "beating justified if the wife refuses to have sex with husband," and "beating justified if wife burns the food." Kishor and Subaiya (2008) assert these dimensions have been theorized to measure conscientization towards gender role attitudes. These items were scored with zero (0) if the woman said no to each of the items and one (1) if the woman said yes to each of these items. Adopting Asaolu et al. (2018)'s scale aggregation approach, scores were summed such that higher scores indicate a married/cohabiting woman being more subservient on the gender role attitude index. In contrast, lower scores indicate a married/cohabiting woman being less subservient on the gender role attitude index. See Appendix D for detailed description of the index.

Cluster variable (cluster id): Households are the primary unit selected for interview in DHS surveys. The definition of a household is a person or group of related or unrelated persons who live together in the same home, acknowledges one adult male or female as the head of the household, shares the same housekeeping arrangements and considered a single unit (Croft et al., 2018).

Control variables: Guided by the theoretical framework, review of the relevant literature discussed above, and previous studies utilizing the DHS dataset, the following demographic variables were included as control variables; Age, ethnicity, religion, years of schooling, place of residence and number of other wives. Age range in this subsample was from 15 to 49 years and was represented as a continuous variable. Education was a continuous variable that consisted of the number of completed years of formal education. In respect of the urban/ rural dichotomy, urban areas are referred to as localities with the population size of 5,000 persons and above (Songsore, 2009). However, the size of the population varies from one administrative region to another with administrative capitals having higher population density. Ethnicity was self-reported and was re-categorized as Akan, Ga, Ewe, Northern tribes and, other ethnicities. Finally, the number of different wives was represented using dichotomous variables with only wife and more than one wife**.**

Analytical Approach

Data analysis was conducted using Stata 15 (Stata Corporation, College Station, TX). A multivariate moderation model is examined to make inferential statistics based on product-moment correlation, polychoric, and regression estimates (Manly & Alberto, 2016).

Data examination

Data examination and cleaning is a fundamental step before any statistical analysis (Creswell & Creswell, 2017; Punch, 2013). Preliminary assessments to make sense of the data structure, to know how missing values are flagged, the total number of observations (regardless of missingness), the total number of variables, and the types of variables (continuous versus categorical) is necessary (Punch, 2013). Next, data cleaning, which involves identifying and addressing invalid data points in a dataset, should be undertaken. As such, investigating such concerns, including outliers, erroneous values [which may be due to typological errors during data entry], and missing values is essential.

These issues can have far-reaching implications for estimation bias, and the statistical power of the model if unaddressed (Creswell & Creswell, 2017). For instance, in the case of missing data, where incomplete responses might have different response profiles is compared to those who responded completely, conclusions drawn based solely on those who responded could be biased (Dong & Peng, 2013). Outliers, on the other hand, can increase error variance and reduce the power of the statistical tests.

To the extent these issues exist, appropriate techniques must be applied to address them. For example, in the case of missing values, replacement with the mean or use of multiple imputations may be carried out. In the case of outliers, such observations may be dropped. However, the focus of data cleaning should be mostly on errors that are beyond small technical discrepancies and those that constitute a significant shift beyond the population distribution and assumptions of the estimation procedure to be used (Dong & Peng, 2013).

Addressed Issues: Missing values, outliers, normality

For examining and cleaning this data, I ran a descriptive model for the continuous variables to obtain various descriptive statistics, such as, central tendency (mean and standard deviation), normality, missing values, range (minimum and maximum values), and verifying the expected

ranges based on variable value labels (coding). Frequency (count; how often something occurs) was used in the case of categorical variables.

The DHS also provides specific rules on how to deal with missing values and other special circumstances. For instance, codes like "inconsistent," "don't know," and "blank" are assigned to special responses (see[4] for a comprehensive review of handling dataset missingness).

Multilevel analysis procedures by default require non-missing data on any of the predictors or the dependent variable for any given observation (Van Buuren, 2011). Although multilevel analyses estimations allow for different group sizes which can be considered a missing data problem, this is a minor concern and corrected with appropriate techniques that accommodate unbalanced designs (Hox, van Buuren, & Jolani, 2015). Observed missing values in the predictors at both level-1 and level-2 have long been treated by listwise deletion. This is easy to do, but may have severe adverse effects, especially for missing values in level-2 predictors. Given that the thesis predictors are at level-1 this presents a minor concern. Indeed, listwise deletion could be useful when the variance of the slopes is large (Grund, Lüdtke, & Robitzsch, 2016). Listwise deletion ensures complete information on each observation, which inherently implies that any individual with some missing information on any variable is eliminated (Grund et al., 2016; Hox et al., 2015). Accordingly, listwise deletion from the original sample of 1828 observations resulted in 678 observations dropped. The final sample utilized after addressing missingness or incomplete data was 1150 with complete observations, which is appropriate and desirable for multilevel modelling and to reduce estimation complexities.

Bivariate analysis

The relationship between the dependent variable and the various independent variables were assessed in a multivariate setting. First correlations between variables were examined. For continuous variable, Pearson Product-Moment Coefficient was used to determine the associations while polychoric and biserial correlations were used for categorical and binary variables respectively.

[4] See, https://dhsprogram.com/data/Data-Quality-and-Use.cfm#CP_JUMP_5188 for an overview

Regression Analysis

The study employed a mixed-effects regression analysis (i.e., multilevel modelling) because the observations are nested within clusters (i.e., households) and to account for the dependency inherent in the data (Goldstein, 2011; Raudenbush & Bryk, 2002). Given that the dependent variable is categorical nature minimizing bias will require mixed ordinal model (Bauer & Sterba, 2011; Hedeker, 2015). More so, mixed ordinal models are preferred and produce less biased estimates compared to normal models given non-normality of data variables (Bauer & Sterba, 2011). Again, for a cross-sectional study, Scott, Goldberg, and Mayo (1997) suggest that this methodological approach is appropriate. Hedeker (2015) suggests a Mixed ordinal regression may be more appropriate for ordinal outcomes in health preventive research. Indeed, unlike other estimation methods, Brant (1990) posits that, in the field of health research, this technic produces an effect size beyond the simple significance testing, which is more valuable.

The Moderation Model

This study follows Preacher, Rucker, and Hayes (2007) moderation estimation procedure. To recap the hypothesis developed, this study was focused on the interaction effect of comprehensive Knowledge on HIV/AIDS, gender role attitudes, and economic status in predicting women's ability to negotiate safer sex. The magnitude of the relationship between two variables can change if there is a moderation effect of a third variable. That is "A moderation effect could be (i) enhancing, where the effect of the predictor (IV) on the outcome (DV) increases with an increase in the moderator would; (ii) buffering, where an increase in the moderator would decrease the effect of the predictor on the outcome; or (iii) antagonistic, where an increase in the moderator would reverse the effect of the predictor on the outcome" (Preacher et al., 2007, p. 191).

Models estimation

Four models were estimated (i.e., Model 1, Model 2, Model 3, Model 4). Before the estimation of these models, a null model was used to estimate the intraclass correlation coefficient (ICC1) to determine whether multilevel modelling is needed (e.g., Raudenbush & Bryk, 2002; Snijders & Bosker, 2012; West, Welch, & Galecki, 2014). The ICC1 is a measure of the proportion of variance in the dependent variable explained by the cluster to justify the need for multilevel modelling (Raudenbush & Bryk, 2002; Snijders and bosker 2012). The value of ICC 1 ranges from 0 to 1, and as such values close to 0 means multilevel modelling may not be an ideal data analysis strategy (Xing, 2016).

In Model 1, the direct effect relationship between comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex was examined, including the control variables representing hypothesis 1. The first moderation effect (i.e., gender role attitudes) was introduced in Model 2, while economic factors (i.e., second moderator) was also introduced in the final Model 3. Thus, one product term each representing the interaction between (a) comprehensive knowledge on HIV/AIDS and gender role attitudes (b) comprehensive knowledge on HIV/AIDS and economic status were modelled for the final model (Williams, Vandenberg, & Edwards, 2009). Model 4 was a robustness check of Model 3 using Bayesian multilevel ordered logistic regression.

Model fit

To measure the goodness –of–fit of the full model, the log-likelihood ratio test of the nested models was calculated and compared to choose the "best" model between the nested models. The likelihood ratio test, also known as deviance index, defined as $-2 \times$ log-likelihood of a maximum-likelihood estimate, was used to assess model fit (Xing, 2016). The smaller the deviance, the better a model fit (Raudenbush & Bryk, 2002).

Robustness check

A robustness check is carried out to assess whether statistical evidence persists across different estimation methods (Lu & White, 2014). Indeed, Bayesian statistics has received substantial attention in the literature (e.g., Asendorpf et al., 2013; Johnson, 2013; Verhagen & Wagenmakers, 2014) as a way of improving research practice. Hence, Bayesian multilevel ordered logistic regression analysis was conducted. Results were reported in odds ratios. Odds ratios is a statistic that quantifies the strength of the association between two variables such that a coefficient greater than one indicates that there is a higher odd of dependent variable happening with exposure to the independent variable in question.

Ethical consideration

Ethical clearance was not sought form the Norwegian Centre for Research Data since the data used for this research was from a secondary source. The institution is mandated with Data Protection for Research for all the Norwegian universities. The Ghana DHS survey has been reviewed and approved by Inner City Fund institutional review board to ensure survey complies with the U.S. Department of Health and Human Services regulations for the protection of human subjects. The host country institutional review board, specifically, Noguchi Memorial Institute for Medical

Research institutional review board also reviewed the survey to ensure that the survey complies with laws and norms of Ghana[5].

Informed Consent

DHS and Inner City Fund have clear guidelines for ethical behaviour when collecting information from individuals. Prior to the data collection, respondents are asked to give their verbal consent to participate in the survey, which is a key requirement by the institutional review board before every survey is approved. Again, it is DHS policy always to respect the respondent's refusal to participate in the survey (see[6] for a comprehensive review).

[5] See, https://dhsprogram.com/What-We-Do/Protecting-the-Privacy-of-DHS-Survey-Respondents.cfm for an overview

[6] See, https://dhsprogram.com/What-We-Do/Protecting-the-Privacy-of-DHS-Survey-Respondents.cfm for an overview

CHAPTER FIVE: RESULTS

Introduction

This chapter presents the results of the statistical analysis conducted to test hypothesized models. First, descriptive statistics and correlations for the study variables are reported. Next, drawing on theoretical and statistical considerations, three competing models estimated are reported and discussed for best fitted and final model selection. Finally, the best fit model is used to address hypotheses 1 to 3 understudy.

Descriptive Statistics

Descriptive statistics is a preliminary analysis of data to describe, display or summarize data in a meaningful way (Creswell & Creswell, 2017). Indeed, descriptive statistics do not make conclusions beyond the data analysed nor reach conclusions regarding any hypotheses made. But it is a necessary first step to describe and observe patterns in a dataset. Useful descriptive statistics include sample size, frequency, mean, median, standard deviation, range, and observation missingness and how they are flagged.

For this thesis, a univariate analysis to observe normality patterns, outliers (i.e., unusual observations of respondent's background on multiple dimensions used in the study) are reported. Table 1 presents the descriptive statistics of means, standard deviation (SD), and percentage age distribution for each variable under study.

Final sample

As discussed in the methods section, the final sample utilized after addressing missingness or incomplete data was 1150 with complete observations, which is appropriate and desirable for multilevel modelling and to reduce estimation complexities.

Socio-Demographic characteristics

In terms of demographic characteristics, the mean age for the national sample was 32.2 years (SD = 7.56) with the distribution of the women ranging from 15 to 49 years old. The age distribution for the urban sample ranged from 16 to 49 years with a mean of 32.3 years (SD = 7.40) while rural sample had an age range of 15 to 49 years with 32.90 years as a mean age (SD = 7.82). The age distribution across the place of residence was evenly distributed. About, 57.6 per cent of women lived in rural areas. The average household size in the sample is three, ranging from one to seven per household.

Table 1: Descriptive characteristics of study variables for married/cohabiting women. Ghana DHS 2014

	Variable type	(%)	Mean	S.D.	Min	Max
Age (years)	Continuous		32.21	7.56	15	49
Education (years)	Continuous		5.03	4.68	0	18
Comprehensive knowledge of HIV/AIDS	Continuous		3.08	1.03	0	5
Gender role attitudes	Continuous		0.64	1.31	0	5
Economic status (index)	Binary					
Not Rich		54				
Rich		46				
Ability to negotiate safer sex	Ordinal				0	2
Cannot refuse sex or request condom use		15.04				
Can either refuse sex or request condom use		20.78				
Can refuse sex and request condom use		64.17				
Ethnicity	Nominal					
Akan		48.6				
Ga/Dangme		6.2				
Ewe		14.9				
Northern tribes		28.7				
Others		2.2				
Religion	Nominal					
Christianity		69.69				
Islam		22.92				
Traditional		3.67				
No religion		3.72				
Place of residence	Nominal					
Urban		52.4				
Rural		47.7				
Number of other wives	Nominal					
Only wife		82.2				
More than one		17.8				

N = 1150

There were nine different ethnic groups as measured by mother tongue in the sample. The four northern tribes put together accounted for 28.70 per cent of the sample. The proportion of southern major ethnic groups in the sample includes; Akan with 48.61 per cent, Ewe group 14.9 per cent, and Ga group with 6.2 per cent. In terms of religious affiliations, the majority of women were Christians accounting for 62.69 per cent with Muslims representing 22.92 per cent. The average

years of schooling among women was five years (SD= 4.68; range 0 - 18 years). In Ghana, a minimum of nine years is required to complete primary education and suggests that the average woman in the sample had not completed basic primary education. For the dichotomized wealth index, which was a binary variable of rich and not rich categories, approximately 54 percent of the sample were in the not-rich category, of which 79 per cent lived in rural areas. The rich category consists of 46 per cent of the sample of which approximately 88 per cent lived in urban centres. Seemly, it suggests that in terms of wealth, there is considerable inequality between urban and rural dwellers.

Ability to negotiate safer sex

As stated earlier, two sub-dimensions were put together to represent three categories of the *ability to negotiate safer sex* in the final analysis to reflect this measure. Regarding the dimension of ability to refuse sex, 74.6 per cent of women reported that they could refuse sex with their partners, while those who responded to the ability to ask the partner to use a condom during sexual intercourse accounted for 66.1 per cent. About 64.2 per cent of women could ask their partner to use a condom and could refuse sex with their partners. Only 15 per cent could neither refuse to have sex nor ask the partner to use a condom. It is interesting to note that, out of the 64.2 per cent majority of women who can ask their partner to use a condom and could refuse sex with their partners, 37 per cent of women live in rural areas. Even though the majority of women are in rural areas, the difference in percentage is not much; hence the sample can be assumed to be evenly distributed across geographical locations.

Comprehensive knowledge of HIV/AIDS

The mean score for the *comprehensive knowledge of HIV/AIDS* scale was 3.08 (SD: 1.03, range 0-5). Twenty-five per cent of women had correctly answered all five questions regarding *comprehensive knowledge of HIV/AIDS*. Twenty-four per cent had four correct answers of *comprehensive knowledge of HIV/AIDS*, and 31.4 per cent had four correct answers of *comprehensive knowledge of HIV/AIDS*, and as low as 6.4 per cent did not give correct answers to any of the five questions regarding comprehensive *knowledge of HIV/AIDS*.

Gender role attitudes

Table 1 reports in percentages, women who said no to each of the five different reasons justifying a husband beating his wife, as well as the percentage of women who agreed with all the reasons and with none of the reasons. The mean score for the gender role attitudes scale was 0.64 (SD: 1.3,

range 0-5). As many as 866 women presenting 75.3 per cent of the sample disagreed with all the specified reasons justifying wife-beating. Out of the 75.3 per cent who disagreed, 34.4 were rural dwellers.

Bivariate Analysis

In the following, correlation coefficients for the associations between variables under study are presented. Table 2 reports Pearson correlation coefficients between continuous variables and polychoric correlation coefficients between (or involving) categorical variables. Weak to moderate correlations were obtained between the independent variables and the dependent variable. Overall, the four main study variables were significantly correlated ($p < .05$). The correlation results are discussed in detail next.

Relationships among main study variables

Comprehensive Knowledge of HIV/AIDS and the ability to negotiate safer sex variables were positively correlated and this association was statistically significant ($r = .07$, $p < .05$). Gender role attitude was negatively related to the ability to negotiate for safer sex ($r = -.14$, $p < .05$) and comprehensive knowledge of HIV/AIDS ($r = -.02$, $p < .05$). Economic status was positively associated with the ability to negotiate safer sex ($r = .08$, $p < .05$) and comprehensive knowledge of HIV/AIDS ($r = .05$, $p < .05$), and negatively associated with gender role attitudes ($r = -.29$, $p < .05$).

Relationships between socio-demographic characteristics and main study variables

Years of schooling was associated with the ability to negotiate for safer sex ($r = .02$, $p < .05$), economic status ($r = .10$, $p < .05$) and gender role attitudes not significant ($r = -.06$). Place of residence was also negatively associated with the ability to negotiate safer sex ($r = -.12$, $p < .05$), economic status ($r = -.08$, $p < .05$) and gender role attitudes ($r = .27$, $p < .05$). Number of other wives was negatively related to the ability to negotiate safer sex ($r = -.03$) but not significant, economic status ($r = -.26$, $p < .05$) and gender role attitudes ($r = .05$) not significant. Ethnicity was associated with the ability to negotiate safer sex ($r = .02$, $p < .05$), economic status ($r = -.32$, $p < .05$) but association to gender role attitudes ($r = .13$) not significant. Religion was negatively associated with the ability to negotiate safer sex ($r = -.07$, $p < .05$), gender role attitudes ($r = .07$, $p < .05$) but not significant to economic status ($r = -.19$).

Table 2: Bivariate association of possible predictors with reported women's ability to negotiate safer sex. DHS Ghana 2014.

	1	2	3	4	5	6	7	8	9	10
(1) Negotiate safer sex	1									
(2) Knowledge of HIV/AIDS	.07*	1								
(3) Gender role attitudes	-.14*	-.02	1							
(4) Economic status	.10*	.05*	- .29*	1						
(5) Number of other wives	-.03	-.05	.05	-.26*	1					
(6) Religion	-.07*	.06	.07*	-.19	.40*	1				
(7) Education (years)	.02*	.05*	-.06	.10*	-.01*	-.08*	1			
(8) Age	-.06*	.02	-.07*	.01*	.14	-.04*	.01*	1		
(9) Ethnicity	.02*	.04	.13*	-.32*	.30*	.60*	-.05*	-.15	1	
(10) Place of residence	-.12*	.05	.27*	-.82*	-.31	-.04*	-.09*	-.10	-.01*	1

Notes: * $p <$ 0.05

Model Estimation and Selection

Base model estimation (Model 1)

In this model, only the predictor variable was estimated with control variables. The main predictor variable *comprehensive knowledge of HIV/AIDS* was significantly and positively associated with the ability to negotiate safer sex (OR = 1.18, $p < .05$). Regarding the control variables, there was no significant effect of years of schooling, age, religion, ethnicity and number of other wives. However, the place of residence, that is rural residence was statistically significant compared to urban residence (OR = 0.67, $p < .001$). In this base model, contextual variables were not included purposely to serve as the basis for a model comparison to subsequent models with increasing model complexity. The model comparison provides a statistical check to justify final model selection. Differently stated, a better fitting and parsimonious model over and above that of Model 1 is the benchmark the thesis perused. Table 3 reports the model comparison indices.

Table 3: Model comparison indices: model deviance and likelihood-ratio test

Index	Model 1	Model 2	Model 3
Log	-1005.94	-1001.26	-997.46
$Deviance\ (-2Log)$	2011.88	2002.52	1994.92
$Likelihood\ ratio\ test$	-	$Model\ 1\ vs\ Model\ 2$	$Model\ 2\ vs\ Model\ 3$
$LR\ (\chi^2, df), p\ value$	-	$\chi^2_{(1)} = 9.34, p < 0.05$	$\chi^2_{(2)} = 7.61, p < .05$

Note: Deviance is purely for model comparison, where a lower value is better.

Review Model estimation (Model 2)

In the estimation of Model 2, Model 1 was nested in Model 2, and the interactive effect of gender role attitude was introduced. The results show a significant interaction effect of gender role attitudes (OR = 0.92, $p < .05$). The main predictor variable *comprehensive knowledge of HIV/AIDS* was still significantly associated with the dependent variable *ability to negotiate safer sex* (OR = 1.27, $p < .001$). Type of residence was still a significant control variable (OR = 0.73, $p < .05$). The other control variables were not significant in Model 2. For model selection, indices of model deviance and likelihood ratio test statistic were utilized, as shown in Table 3. The model deviance of Model 2 (2002.52) is lower in comparison to the deviance of Model 1 (2011.88) as reported in

Table 3 and suggests Model 2 is a better fitting model. Results of likelihood ratio test of Model 1 and Model 2 support the choice of Model 2 ($\chi^2_{(1)} = 9.34, p < 0.05$).

Full model estimation (Model 3)

Model 3 introduced more complexity with the introduction of a second moderation. Specifically, Model 2 was nested in Model 3 in addition to introducing a second interaction variable: *Economic status*. The results show a significant interaction effect of gender role attitudes (OR = 0.91, $p < .005$) and economic status (OR = 0.68, $p < .01$). The main predictor variable *comprehensive knowledge of HIV/AIDS* was still significantly associated with the *ability to negotiate safer sex* (OR = 1.46, $p < .001$). In Model 3, however, the place of residence was not significant, unlike in Model 1 and 2. The other control variables were still not significant, just like in Model 1 and Model 2. Model deviance (1994.92 < 2002.52) and likelihood ratio test ($\chi^2_{(2)} = 7.61, p < .05$) support Model 3 over Model 2. Hence, Model 3 is chosen as the final model and used to assess the hypotheses and make inferences.

Regression Results

A multilevel ordered logistic regression model with a random intercept was used to estimate the hypothesized multiple moderation model. Also, a Bayesian multilevel model was estimated for model comparisons (see Table 4). The intraclass correlation (ICC1) was .21 and suggested a significant nesting effect (Liu, 2015, p. 432) that 21% of the variation in married women's '*ability to negotiate safer sex'* occurs across household clusters. Hence, a multilevel approach is appropriate. Model 3 of Table 4 reports the final estimates which is used to assess hypothesis 1 and to compute marginal effects to address hypotheses 2 and 3.

Direct Effect of Comprehensive Knowledge of HIV/AIDS

As reported in Table 4, the hypothesis 1 that comprehensive knowledge of HIV/AIDS is positively associated with married woman's ability to negotiate safer sex is statistically significant ($p < .001$) and supported. That is, for a one unit increase in a married woman's knowledge of HIV, the odds of high levels of the ability to negotiate safer sex versus the combined middle and low ability to negotiate safer sex categories are 1.46 times greater, holding all other factors constant. This result suggests that women with higher comprehensive knowledge of HIV/AIDS have a higher chance to succeed in negotiating safer sex than those with low knowledge about HIV/AIDS.

Table 4: Results of multilevel moderation: contextual effects of gender role attitudes and economic status on the association between comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex. Ghana DHS2014

	Dependent variable: Negotiate safer sex			
	Multilevel ordered logistic			Multilevel Bayesian
Variables	Model 1	Model 2	Model 3	Model 4
Comprehensive Knowledge of _HIV	1.18*	1.27***	1.46***	1.50
	(0.08)	(0.09)	(0.13)	[1.36, 1.65]
Gender role attitudes		1.14	1.21	1.25
		(0.16)	(0.19)	[1.03, 1.48]
Knowledge of HIV x Gender role		0.92*	0.91*	0.90
		(0.04)	(0.04)	[0.84, 0 .95]
Economic status				
*Not rich (*reference category)				
Rich			3.37**	3.49
			(1.56)	[2.24, 4.93]
Knowledge of HIV x economic status				
Rich			0.68**	0.68
			(0.10)	[0.58, 0.78]
Years of schooling	1.01	1.01	1.01	0.99
	(0.04)	(0.04)	(0.04)	[0.97, 1.00]
Age	0.98	0.98	0.98	0.76
	(0.01)	(0.01)	(0.01)	[0.62, 0.90]
Religion				
Christianity (reference category)		-	-	
Islam		0.79	0.82	0.80
		(0.17)	(0.19)	[0.62, 0.99]
Traditional		0.46	0.46	0.49
		(0.23)	(0.26)	[0.40, 0.58]
No religion		0.71	0.77	0.77
		(0.28)	(0.33)	[0.48, 1.16]
Ethnicity				
Akan (reference category)		-	-	
Ga	0.82	0.99	0.85	1.04
	(0.24)	(0.25)	(0.24)	[0.92, 1.17]
Ewe	1.34	1.43	1.42	1.49
	(0.29)	(0.27)	(0.31)	[1.04, 2.07]
Northern tribes	1.01	1.23	1.11	1.16
	(0.20)	(0.21)	(0.22)	[1.05, 1.29]
Other tribes	0.61	0.73	0.63	0.79
	(0.34)	(0.36)	(0.35)	[0.55, 1.07]
Number of other wives				
No other wife (reference category)		-	-	
More than one wife	1.90	1.47	1.66	1.46
	(1.28)	(0.89)	(1.11)	[1.09, 1.84]
Type of residence				
Urban (reference category)		-	-	
Rural	0.67**	0.73*	0.74	0.76
	(0.11)	(0.09)	(0.14)	[0.62, 0.90]

Notes: Estimates reported are odds-ratios. +credible interval based on Bayesian estimation. N = 1150, n = 382
t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Interactions and Marginal effect

Odds ratios were estimated based on Model 3, but the inferences based on odds ratio is potentially misleading because one does not offer a sense of the magnitude (Liu, West, Levy, & Aiken, 2017). To make meaningful inferences about the statistically significant moderation effect from an ordered logistic model, marginal effects is more informative than odds ratios by presenting results as difference in probabilities (Baron & Kenny, 1986; Dawson & Richter, 2006). That is, difference-in-difference effects of comprehensive knowledge of HIV/AIDS on the ability to negotiate safer sex between groups for a given moderator. The Stata 16[7] statistical software command 'margins' is a numerical method that computes a probabilistic statistic (margins of responses) based on predictions from Model 3 by manipulating the values of the covariates of interest. Specifically, the 'predictive margins' used to estimate marginal effects allow for three covariates to be varied (i.e., *comprehensive knowledge of HIV/AIDS, Gender role attitudes and Economic status*) and all control variables to be fixed. The rationale is that, it allows for comparison between two respondents similar in many aspects but differ along a given moderator variable. Accordingly, the interaction effect from Model 3 can be interpreted based on a probability scale that is meaningful and informative.

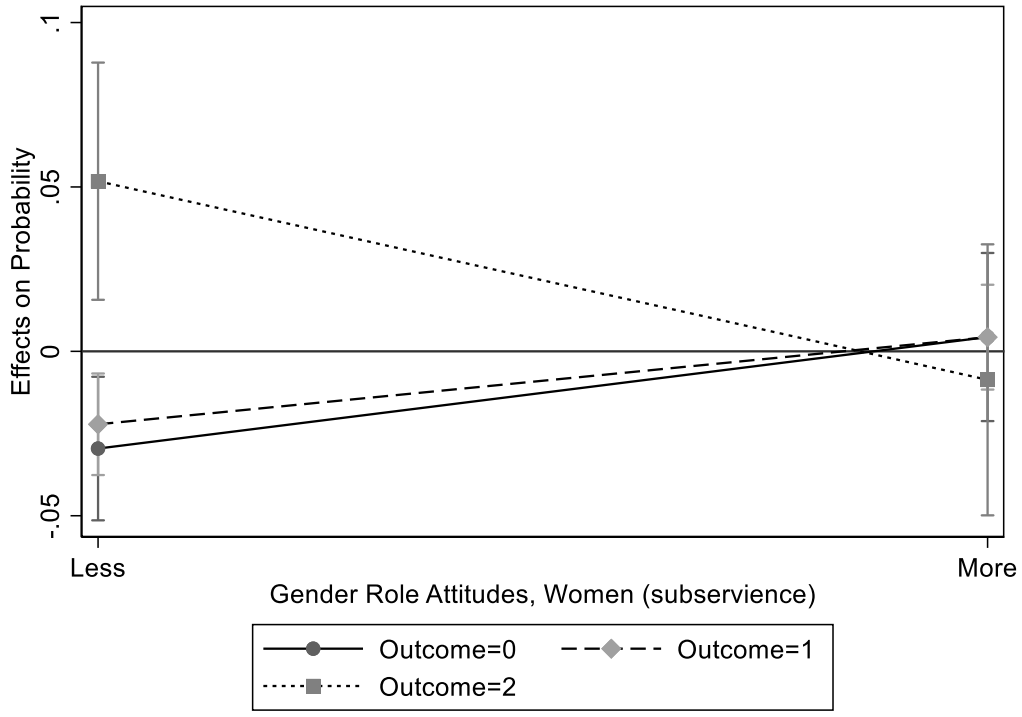
The Stata 16 'margins' procedure is as follows. First, predictions are estimated based on derivatives of increasing small changes in comprehensive knowledge of HIV/AIDS. Next, Stata takes the average of predictions from step 1 so the marginal effects of comprehensive knowledge of HIV/AIDS is the numerical derivative for given values of the moderator variable (low vs high; $\pm 1\ SD$ about the mean). See appendices E and F for plots illustrating step 2 for each moderator variable under study. In the final step 3, the difference in predictive margins, which examine whether the effect of comprehensive knowledge of HIV/AIDS is different for low and high values of the moderator variable is significant is computed. Stata's 'marginsplot' command is used to visualize differences in predictive margins of comprehensive knowledge of HIV/AIDS for the moderator variables (at low and high values; $\pm 1\ SD$ about the mean) as reported in Figures 7, 8, 9 and 10.

[7] StataCorp. 2019. Stata Statistical Software: Release 16. College Station, TX: StataCorp LLC.

Interaction effect of gender role attitudes

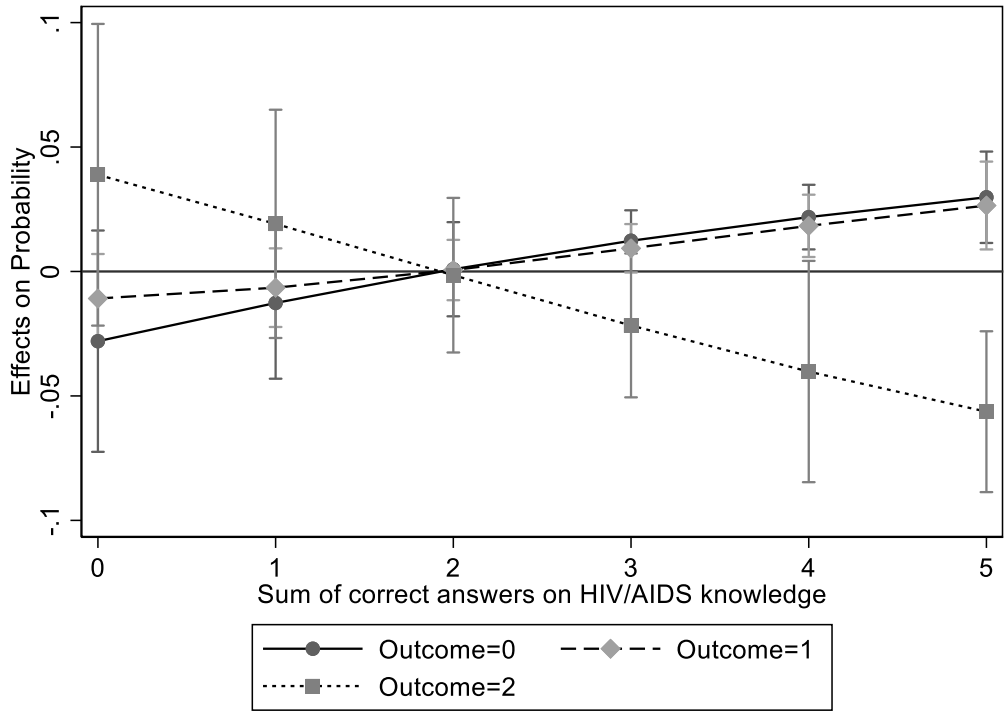
To address hypothesis 2, Figure 7 illustrates how the effect of comprehensive knowledge of HIV/AIDS on the ability to negotiate safer sex depend on women's gender role attitudes. The conclusion is that the effect of comprehensive knowledge of HIV/AIDS appears to be stronger for women associated with low gender role attitudes (i.e., less subservient) at all levels of the outcome variable (ability to negotiate safer sex) and the difference is statistically significant. Comparing the contrast in predictions at outcome levels 0, 1 and 2 shown in Figure 7, it seems to suggest that the effect of comprehensive knowledge of HIV/AIDS is higher among women with low gender role attitudes and diminishes (i.e., gets closer to zero) as gender role attitudes increase (i.e., more subservient). It can therefore be inferred that among more subservient women, the effect of comprehensive knowledge of HIV/AIDS is largely insignificant. Hence hypothesis 3 is supported.

Figure 7: Average Marginal Effects of Comprehensive Knowledge of HIV/AIDS with 95% CIs



Similarly, Figure 8 illustrates how the effect of gender role attitudes on the ability to negotiate safer sex depends on comprehensive knowledge of HIV/AIDS. Figure 8 seems to suggest that as knowledge of HIV/AIDS gets comprehensive (beyond value = 2 on x-axis), differences in effects of gender role attitudes increases among women associated with outcome level (the ability to negotiate safer sex) 0 or 1 but decreases when the outcome (the ability to negotiate safer sex) is 2 (i.e., high).

Figure 8: Average Marginal Effects of Gender Role Attitudes with 95% CIs

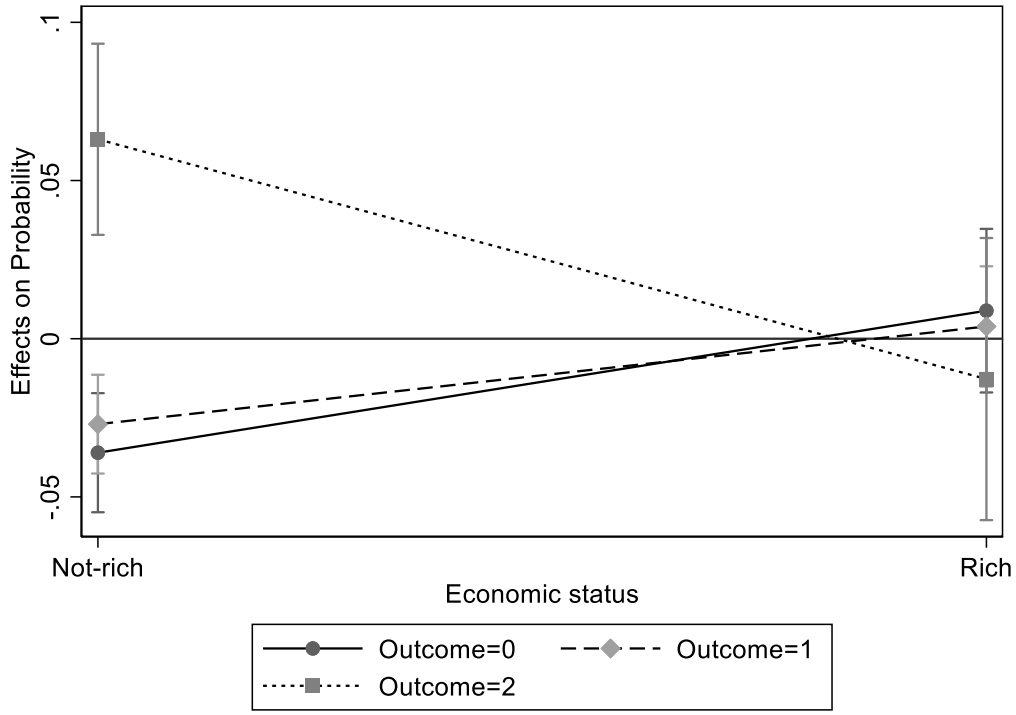


Interaction effect of married woman's economic status

For hypothesis 3, this thesis examined how the effect of comprehensive knowledge of HIV/AIDS depends on economic status. The pattern of the effect of the comprehensive knowledge of HIV/AIDS appears to be somewhat different for rich women and not-rich women (see Appendix F). To better see how the difference in the effect of the comprehensive knowledge of HIV/AIDS between rich women not-rich women, a difference-in-differences estimate is displayed for each economic status group (rich versus not-rich) in Figure 9. One can see that, the difference in effects between rich and not rich women seems to suggest that the effect of comprehensive knowledge of HIV/AIDS is more pronounced among the rich-group women and is diminished (approaches zero)

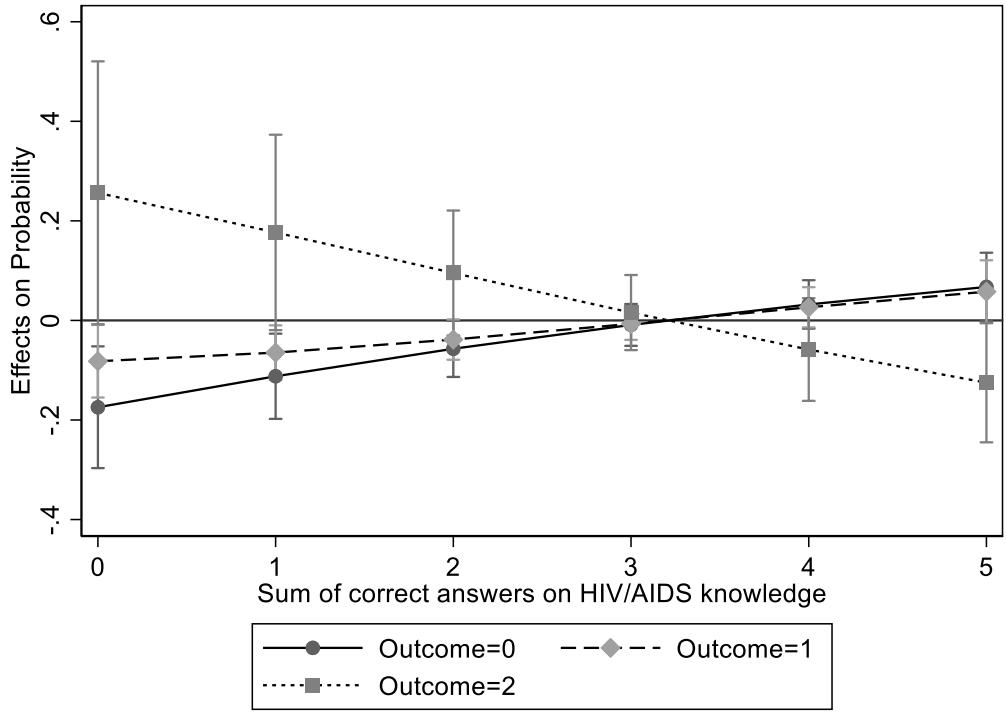
for the not-rich group. It can therefore be inferred that economic status shapes the effect of comprehensive knowledge of HIV/AIDS such that when women are financially better-off the impact of comprehensive knowledge of HIV/AIDS is strengthened. Hence, hypothesis 3 is supported.

Figure 9: Average Marginal Effects of Comprehensive Knowledge of HIV/AIDS with 95% CIs



Similarly, Figure 10 illustrates how the effect of economic status on the ability to negotiate safer sex depends on comprehensive knowledge of HIV/AIDS. Figure 10 seems to suggest that as knowledge of HIV/ASIDS gets comprehensive (beyond value = 2 on x-axis), differences in effects of economic status increases among women associated with outcome level (the ability to negotiate safer sex) 0 or 1 but decreases when the outcome (the ability to negotiate safer sex) is 2 (i.e., high).

Figure 10: Average Marginal Effects of Economic Status with 95% CIs



Robustness Check

As part of checks for the robustness of Model 3 estimates (multilevel ordered logistic model), a Bayesian multilevel ordered logistic regression model was estimated and reported as Model 4 of Table 4. Overall, a comparison of both model estimates appears to be consistent in terms of statistical significance and effect magnitude in terms of odd ratios.

CHAPTER SIX: DISCUSSION

Introduction

In this chapter, a discussion of the study findings, including the implications for theory and practice, study limitations and outlook for future research in the broader field of health promotion is detailed sequentially in the sub-sections that follow. A concluding remark ends the chapter.

Study Findings

The overall objective of this thesis was to examine the interplay of individual factors (i.e., comprehensive knowledge of HIV/AIDS) and collective/contextual factors (gender role attitudes and economic status) on women's ability to negotiate safer sex. The results show that the main predictor variable *comprehensive knowledge of HIV/AIDS* was positively associated with *ability to negotiate safer sex*. Also, there was significant interaction effects on the ability to negotiate safer sex such that the average marginal effects of comprehensive knowledge of HIV/AIDS is somewhat different for (i) high and low gender role attitudes and (ii) among rich and not-rich groups of women (economic status variable). However, the change in probability of success in negotiating safer sex varied between outcome levels 0, 1 and 2. This implies that women's associated ability to negotiate safer sex impacts the moderation effects between comprehensive knowledge of HIV/AIDS on one hand, gender role attitudes and economic Status on the other hand. As observed at the different slopes in Figures 7, 8, 9 and 10, the differences in slopes suggest that for women associated with outcome level two of the ability to negotiate safer sex variable, the interaction effect of comprehensive knowledge of HIV/AIDS and gender role attitudes is associated with a decrease in the probability of improved ability to negotiate safer sex. Rather the interaction effect of comprehensive knowledge of HIV/AIDS and gender role attitudes on probability of improving the ability to negotiate safer sex is increased for women associated with an initial lower level outcome (i.e., outcome level 0 and 1). Similar slope patterns emerged for the contextual role of women's economic status.

Accordingly, the study finds that gender role attitudes and economic status of women are significant and necessary scope conditions that impacts the expected positive association between comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex. Poor and more subservient women are therefore vulnerable and less likely to attain healthy sexual lifestyle choices if intervention strategy focuses only to increase knowledge and awareness. Overall, the findings

from this thesis forms part of research efforts that shed light into discussions about the gendered gap in HIV/AIDS prevalence and sexually transmitted diseases in general.

Role of comprehensive knowledge of HIV/AIDS

This thesis found a positive association between comprehensive knowledge of HIV/AIDS and women's ability to negotiate safer sex. In part, ability to negotiate safer sex has implications for sexual health lifestyles and to prevent STDs (including HIV/AIDS). It therefore stands to reason that comprehensive knowledge about a health-related phenomenon is functioning and can enhance healthy lifestyle choices. This assertion is theoretically grounded. According to the integral theory, the individual interior (i.e. healthy mind) and individual exterior (healthy action), which forms part of the theoretical framework of this thesis explicates how comprehensive knowledge of HIV/AIDS supports women's ability to negotiate safer sex, holding other conditions/factors constant. Other psychological theories such as the Health Belief Model (see, Becker, 1974) which theorise that an essential mechanism through which individuals change and maintenance a health-related behaviour is through knowledge is also supported based on the results of this thesis. Previous studies, such as Tenkorang (2012) in a cross-sectional study among married women in Ghana, found a positive association between knowledge about HIV/AIDS and the ability of a woman to ask their partners to either use a Condom or refuse sex. In a similar context, studies by Amoyaw et al. (2015) and De Coninck et al. (2014) utilizing the DHS data found that HIV awareness and safer sex negotiation were significantly associated. In furtherance, the concept of health education, a key component of health promotion (Green et al., 2015, p. 25) provides support to the important role of knowledge in health lifestyles and choices. Indeed, this approach in health intervention has long been acknowledged as a primary driver towards healthy action provided such information is factual (Green et al., 2015, p. 25; Naidoo & Wills, 2016, p. 79). Thus, at the individual level, a healthy mind can help facilitate the adoption of healthy behaviour which is voluntary especially where the health education model is empowering (Tilford, Green, & Tones, 2003).

Gender role attitude as a contextual factor

Equally important, heterosexual relationships involve co-determining the social context within which women can negotiate safer sex. The healthy lifestyle choices individuals make, especially women, are a function of both the self and the collective (i.e., healthy culture partner, or spouse). Traditional behavioural strategies have primarily placed priority on the rationality of the individual, neglecting the broader context (Amaro, 1995; Mittelmark et al., 2012; Waldo & Coates,

2000). However, scholarship discourse on HIV/AIDS prevention (e.g., Amaro, 1995; Coates et al., 2008; Waldo & Coates, 2000) have long called for a multiple levels' conceptualization of the determinants of HIV risk behaviour to have a holistic preventive approach in addressing this gap. Indeed, everything seems to be connected to everything in some way and considering the complexity of the health processes, a system view approach is appropriate (Mittelmark et al., 2012). According to the integral theory, the interplay of determinants at the individual and collective levels provide a multilevel perspective into determinants that shape women's ability to negotiate safer sex. As such, the theoretical foundations that structures this thesis shows the importance of gender role attitudes in shaping the associations between women's comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex. Ultimately, this thesis has implications for several healthy behavioural choices of heterosexual married/cohabiting women (perhaps, women in general).

Although gender role attitudes are increasingly relevant in the discourse on women's health choices, there seems to be variation in gender role attitudes as a result of cultural differences and ongoing transitions in the gendered allocation of social roles (Macintyre, Hunt, & Sweeting, 1996). Further, the surge of women into the labour force in the past three decades has partly contributed to the transition in gender roles (McDonough & Walters, 2001). However, Crompton and Harris (1998) argues that while gender roles may be changing towards less subservience, it still poses a hindrance to healthy behaviour. A major challenge, as proposed by McDonough and Walters (2001), is to explore meaningful ways that make gender an important representation of inequality. Gender has primarily been conceptualized based on the sex difference as opposed to the gender perspective (Mickelson, Claffey, & Williams, 2006). Hence, the need for theoretical and empirical studies to identify the predictors of changing gender roles is imperative.

Accordingly, this thesis empirically examined gender role attitudes as a contextual/collective factor hitherto overlooked in the literature. As predicted, the statistically significant interaction effects support the gender role attitudes as a contextual factor in the relationship between comprehensive knowledge of HIV/AIDS and married/cohabiting women's ability to negotiate safer sex after adjustment for relevant sociodemographic factors.

The study findings suggest that, the odds of success of a woman's comprehensive knowledge of HIV/AIDS been associated with increased ability to negotiate safer sex is weakened when she is

more subservient. The moderation effect seems to suggest that although comprehensive knowledge of HIV/AIDS is a significant predictor, its effectiveness in influencing women's healthy choices is contingent on the status of their gender role attitudes. Thus, the extent to which women have subservient position within the household is likely to influence their ability to negotiate safer sex regardless of their knowledge. In line with Agarwal (1997) description of the role of social norms and Kandiyoti (1988) 'patriarchal bargain', one can speculate that gender ideology can limit women's options of what is possible. Besides the thesis's argument, existing research that has predominantly examined gender role attitudes either as a control variable (e.g., De Coninck et al., 2014; Tenkorang, 2012) or a predictor variable (e.g., Amoyaw et al., 2015; Greene & Faulkner, 2005; Pulerwitz & Dworkin, 2006) supports the findings. For instance, Greene and Faulkner (2005) study found that, women who were less subservient indicated that they were able to negotiate safer sex with their partners.

Drawing upon gender and power theory (Connell, 2013) and the integral theory, the interaction between behaviour and social environment is theoretically grounded. In particular, the influence of the collective interior (i.e., healthy culture) on the relationship between the individual interior and the individual exterior of the integral theory seems to provide the theoretical support to this finding. Hence, there is solid theoretical background to support gender role attitudes as a contextual factor in part because it is influenced by the social environment (i.e., marriage, ethnicity, religion, and cultural norms).

Economic status of women as a contextual factor

This study found that comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex relationship is dependent on the economic status of the woman such that, the relationship would be strengthened when a woman is rich as compared to not being rich. Thus, the contextual role of married women's economic status is supported such that the association between comprehensive knowledge of HIV/AIDS and the ability to negotiate safer sex is strengthened among women with high economic status. This finding converges with results from previous studies (e.g., Amoyaw et al., 2015; De Coninck et al., 2014; Tenkorang, 2012) although those studies treat the economic status variable as a control variable. For example, Tenkorang, (2012) found that, rich women were more likely to say they can refuse to have sex with their husbands or ask them to use condoms, compared to poorer women.

In line with Kabeer (2005) conceptualization of empowerment as the interaction of agency, resources, and achievements, the role of economic status as a resource is an underlying mechanism for an agency (i.e., the ability to negotiate safer sex) to be exercised. Differently stated, economic status as a resource has the potential to change the dynamics of power which in turn have implications for women's health and well-being. Drawing on the integral theory, the interaction effect of the collective exterior (economic status) on the relationship between individual interior and individual exterior provides theoretical support to this finding. Thus, ITS quadrant of the integral model utilized (see Figure 5), seems to suggest a healthy system (i.e., social and ecological) or structural barriers can influence healthy actions.

Evidence from studies drawing on economic theory shows a positive relationship between bargaining and women economic resources (Beegle et al., 2001; Quisumbing & Maluccio, 2003) providing a theoretical perspective that explicates the role of economic status. Altogether, extant empirical and theoretical literature justifies the moderating effect of economic status. A reflection of this points to the role of health policy in the health promotion discourse. More importantly, this thesis points to structural barriers and the need for policy initiatives that enhance access and distribution of resources to minimize inequality. Such policy initiatives could create the enabling systems for women (and married/cohabiting women in particular) to champion the mantra 'healthy choice, the easy choice'.

Other covariates

As reported in chapter five, there was no significant association between the control variables and the ability to negotiate safe sex after the introduction of gender role attitudes and economic status as moderators. However, these socio-demographic factors have been extensively reported in the literature to have a significant effect. For instance, women's educational attainment was not a significant predictor throughout the different models estimated. Albeit formal education is fronted as a tool for empowerment (Kabeer, 1999, 2005). Evidence, however, seems to suggest, the predictive power of women's education is not significant until women have completed secondary or higher education (Vyas & Watts, 2009). This finding may reflect the generally low educational attainment levels in the population, as reported in chapter five.

Regarding ethnicity and religion, studies have shown a significant relationship between these variables and ability to negotiate safer sex although mostly as control variables (e.g., Amoyaw et

al., 2015; Chai et al., 2017; Tenkorang, 2012). In a few studies (e.g., Chai et al., 2017; Ung et al., 2014; Wang, 2013) a significant association of religion and ethnicity as predictors on ability to negotiate safer sex were reported. In this study, ethnicity and religion were not a significant control variable. Perhaps the explanatory power of these control variables is explained by the introduction of gender role attitudes, which in the survey context (Ghana) are core factors shaping married women's relationships with the spouse (Awusabo-Asare et al., 1993). More broadly, gender role attitudes are learned behaviours in a given society, are affected by age, class, race, ethnicity, and religion (March, Smyth, & Mukhopadhyay, 1999) and thus gender role attitudes are a composite of ethnicity and religion effects.

Methodological Issues

While this thesis has made an important contribution to understanding married or cohabiting women's ability to negotiate safer sex within a multilevel context, there were some limitations. As such, the study findings should be interpreted within the methodological issues outlined next.

Limitations

Omitted variable bias

First, the thesis analysis involved the use of secondary data collected as part of a large national sample. Therefore, the objectives and in particular the hypotheses this thesis undertakes is not explicitly taken into consideration, in the design of the DHS a concern which is inherent in utilizing existing dataset (Cheng & Phillips, 2014). As such, data on some important predictors were absent. Indeed, the omission of a relevant predictor can induce correlations between the error term and the independent variables (Cheng & Phillips, 2014; Lütkepohl, 1982). In this thesis, a theoretical basis fronted the need to integrate the dyadic nature of sexual relationships into the research model; however, such a variable was absent in the dataset. Differently stated, while this thesis presents a discussion into the vulnerability of women, it is worthy to note the dyadic nature of sexual encounters (see, Amaro, 1995; Higgins, Hoffman, & Dworkin, 2010) which was not under consideration in this study.

Survey design

The secondary data utilized was based on a cross-sectional (correlational study) design and limits the possibility of making causal inferences (see, Levin (2006) for an overview about making a causal inference). Therefore, the basis for the interpretation of results is on the evidence of co-variation and author's confidence in the examination of the theoretical model proposition. To

establish causality, a more direct measurement of mechanisms, longitudinal design, or repeated measures with at least two-time points are necessary. Perhaps, that could contribute important knowledge into this and other aspects of the topic under study.

Validity of Self-Reported Sexual Behaviour - Participation and social desirability bias

Individuals view sexual activity as a private matter. Sexuality scholars have therefore observed a pattern which seemly suggests that people are less likely to disclose issues related to their sexual encounters either due to feelings of embarrassment or threat (Joseph A. Catania, McDermott, & Pollack, 1986; Herold & Way, 1988). Hence the chances of a high probability of participation bias in the survey of sexual behaviour cannot be ruled out. The DHS survey, which measures women's sexual behaviour is likely to suffer from participation bias. The DHS methodological report (Pullum, 2019) does not provide any information regarding participation bias or explicit measures to reduce it. However, the low number of missing data (4%) per the report at least is an indicator that a very high proportion of the respondents did answer the questions.

More importantly, studies that rely on self-reported sexual behaviour data may face Social desirability bias (Krumpal, 2013). Socially acceptable behaviours create different expectations, for males and females and hence distinct pressures in reporting certain outcomes, which can distort assessments of risk for HIV and STI (Catania et al., 1986). Considering the social context of sexual behaviour in Ghana, women will probably underreport their ability to negotiate safer sex and gender role attitudes.

Theoretical limitation

Ken Wilber's integral model is an inclusive theoretical perspective, but this thesis takes a partial view of the integral theory in terms of its empirical assessment. The partial view is in part due to the secondary nature of the dataset discussed above. The thesis focused on the four quadrants of the model. It did not consider the other elements (i.e. levels, lines, states, and types) that together constitute the five elements of the integral model (see, Wilber (2001) for a comprehensive overview). Hence the utilization of the integral theory was not encompassing. However, applying the full model would also mean that it would far exceed the scope of a master's thesis.

Strength

Extension on the theoretical perspective of gender role attitudes

Health promotion research is concerned with developing knowledge that is meaningful and can help individuals and communities promote their health (Mittelmark et al., 2012). This thesis contributes to the research literature by showing the important role of gender role attitudes as contextual factors that shape health lifestyles, especially those pertaining to women sexual behaviour. This thesis, to the best of my knowledge, is the first that investigates the moderating role of gender role attitudes on the relationship between comprehensive knowledge of HIV/AIDS prevention and married/cohabiting women's ability to negotiate safer sex. As such, this thesis contributes to filling a void within the research field.

Holistic approach to the conceptualization of women's ability to negotiate safer sex

The findings of the study contribute to the literature by developing a conceptual framework to understand the interactions of individual and collective determinants by empirically validating the relationships. This thesis adopted an integral theory as the overarching theoretical framework and a multilevel moderation analysis that explicates contextual factors on the relationship between comprehensive knowledge of HIV/AIDS and married or cohabiting women's ability to negotiate for safer sex. The findings support the relevance and richness of the integral theory for future research in the field.

External validity (generalizability of study findings)

A major interest of public health research is the applicability of study findings to an unobserved population (Polit & Beck, 2010). One quality assessment indicator in quantitative research is the generalizability of findings. Where broad inferences about the unobserved are drawn based on the observed is important (Kerlinger & Lee, 2000; Polit & Beck, 2008). The most commonly used tool to evaluate the generalizability of a study is Firestone (1993) statistical generalization which is an inference based on the sample population.

The DHS dataset is based on a sample of clusters (usually villages or urban blocks) which is a representative of married/cohabiting women in Ghana (Ghana Statistical Service (GSS), 2015). Hence one can make an inference that this thesis exhibits external validity (generalizability) in terms of its findings because it provides a systematic and evidence-based perspective that can be applicable to different geographical settings and people outside of the context studied. As such, the thesis results have wide-reaching implications for theory and practice in many geography

settings. However, it is noteworthy that the study findings are not directly transferrable even if contexts are similar.

Given that Ghana was the study context in this thesis, the study findings can have wide-reaching implications for researchers, policymakers and practitioners within Ghana and the broader sub-Sahara Africa because of the similarities in culture, social norms, and religious orientations about the role of (married) women. In terms of further research in other context, similar analyses can be conducted on other countries' DHS datasets as replication studies.

Implication for Practice

Health promotion planning

These results taken together provides substantial evidence and supports calls for the convergence between empowerment and equity, a central tenet in health promotion (Green et al., 2015, p. 25) that has dominated the recent changes in the knowledge base and practice of health promotion (Burton & MacDonald, 2002). More in line with the concept of empowerment utilized in this study is the application of psychological theories to link the relationship between the right knowledge and healthy action. Based on the findings of the study, one can infer that empowering women through an increase in access to HIV/AIDS-related information is vital in improving their ability to negotiate safer sex. More broadly, women's access to comprehensive sexuality education is an important element in reducing sexually transmitted diseases. Thus, access sexual reproductive knowledge is a key component of empowerment (Green et al., 2015, p. 25) and will act as an enabler for a (married) woman to make an informed, healthy lifestyle decision.

Beyond comprehensive knowledge of HIV/AIDS, which is still relevant per the findings of this study, it is also evident that contextual factors matter as well in shaping a healthy action. It is important to understand the circumstances that married women face given the social norms and cultural contexts. To an extent the magnitude of these factors may constrain or enable efforts of vulnerable groups (especially women) in adopting a healthy behaviour should be a matter for policymakers ought to consider and circumvent. As put forward by Ryan (1976), the underlying mechanisms of health are power and money (cited in Green et al., 2015). The empirical examination of this study shows how gender role attitudes and economic status directly or indirectly structure the link between sexual health-related knowledge and women's ability to negotiate safer sex.

Also, addressing environmental factors (i.e., social determinates of health) call for action on addressing the issue of equity. "*Equity in health implies that ideally, everyone should have a fair opportunity to attain their full health potential and, more pragmatically, that no one should be disadvantaged from achieving this potential if it can be avoided*" (World Health Organization, 1986, p.4). This thesis points to equity indirectly by showing that women who can reject subservient gender roles are better positioned to make healthy sexual lifestyle choices. Hence, public policy should aim to empower women in lasting ways that minimize gender disparities, especially among heterosexual couples. Overall, given the prospects of considering the roles mentioned above of empowerment and equity, the calls for the integration of health education and health policy in the field of health promotion planning and practice is timely. The conceptualization of health promotion as the "synergistic interaction between health education and healthy public policy" (Green et al., 2015, p. xxii), calls for a comprehensive approach to women's sexual behaviour. Accordingly, efforts towards the design of health promotion programmes and implementation should inculcate the development of cognitive capabilities and sound healthy public policy interventions that address women vulnerability.

Level-specific interventions

While this study supports the call for an integration of health education and healthy public policy, level-specific interventions need to be made explicit. A three-level interventionist approach for health promoters is identified within the literature to champion public policy intervention as holistic effectively. For any meaningful public health intervention to be effective (Mittelmark et al., 2012) and particularly HIV prevention-science agenda (Waldo & Coates, 2000), a multilevel intervention strategy is critical. Drawing on Waldo and Coates (2000) levels of intervention in HIV/AIDS prevention and based on the results of this thesis, the following levels are proposed: individual, community and societal levels.

Individual level: Health practitioners should embrace the concept of enablement by providing HIV/AIDS information given that, a well-informed person on the threats of HIV/AIDS is likely to take appropriate self-protective action. Differently stated, health psychologists and educators who work at the level of individuals (downstream level), should focus on assisting women to acquire knowledge and skills to make an informed decision. More broadly, at the individual level, approaches that seek to empower women and girls can equalize the imbalances in power between women and their spouses (men) to reduce their vulnerability to HIV/AID (Wingood &

DiClemente, 2000). As demonstrated in this thesis, the effectiveness of an individual-level intervention is supported. Whiles the emphasis of this thesis is on married/cohabiting women, it is equally important to involve their partners since sexual activity is dyadic. More importantly, sexual negotiation is a private and thus individual-level modelling of empowerment programs are desirable (Noar et al., 2006).

Community-level: Action can be taken by health promoters at the community level to address social norms that constrain women's ability to negotiate safer sex through advocacy. Health promoters should focus on facilitating the social change process through community participation to address attitudes, values, and practice that put women at risk. Key actors like traditional authorities, religious leaders who enforce and often regarded as guidance of these gender roles need to be engaged based on the evidence presented in this thesis on how gender roles contribute to women's vulnerability. Besides, the role of community actors, peer education at the community level will bring more meaning to the social change process. Thus, health promoters should facilitate the building of peer group networks among women to act as a medium for safer sex negotiation discussion.

Societal level: Health promoters should collaborate with several stakeholders, including health policy analysts, to integrate gender-related health policy into interventions aimed at improving the sexual behaviour of women. Such an approach will help policymakers rethink the interconnectedness and impact of policy on health. Mandal, Muralidharan, and Pappa (2017) systematic review of gender-integrated health programs in low-and middle-income countries point out the need for gender equity strategies in health policies. As such, the need for institutionalization of measures that consider the contribution of housework, care work and other activities regarded as roles of women but not financially rewarded. Accordingly, health promoters are encouraged to collaborate with policymakers, in addressing these ecological factors that may constraint married or cohabiting women ability to negotiate safer sex.

Implications and Outlook for Future Health Promotion Research

In this section, the thesis offers future research directions towards an integrative approach to HIV/AIDS intervention. The suggestions offered will address theoretical and methodological research gaps bothering the field.

Potential contextual variables (couple gender roles, trust, drugs and alcohol)

There is a need for future research to expand on this thesis to identify the antecedent conditions that enable or limit the effectiveness of health-related knowledge on purposeful behavioural choices of individuals. This thesis recommends that, further research may consider analytically advancing the evidence presented in this thesis beyond the limited DHS indicators. A consideration of partner/spouse dimensions brings to the front the gender-related attitudes and dynamics of couples, which can provide a deeper understanding of behavioural patterns (Huston & Geis, 1993). For instance, the potential of husband attitude being more subservient within marriage (i.e., egalitarian gender role attitudes). In contrast, where the woman being less subservient can change the mechanisms that gender role attitudes may play in the relationship. Future research, therefore, should consider and measure the gender roles of married/cohabitating couples (Acitelli & Antonucci, 1994). This assertion for future research is shared by (Mickelson et al., 2006). A further search through the extant literature seems to suggest that published studies have not focused on couple gender role attitudes. Such a dyadic relationship is relevant and needs to be included in future modelling and theory development about women's ability to negotiate safer sex.

Some studies also suggest a link between alcohol consumption and the appraisals of HIV risk and the likelihood of sexual intercourse (Norris et al., 2004; Wingood & DiClemente, 1998). Arguably, alcohol consumption can influence negotiations about condom use and the decision to have unprotected sex (Norris et al., 2004). Hence, future research can consider addressing the extent to which drug abuse (or addictions), including alcohol use, affects women's ability to negotiate safer sex building on the conceptual framework of this thesis.

Another future research direction might be to consider social norms that orient married women to prioritize their intimate relationships even if it at odds with protecting their sexual health (Cline, 2003). Seemly, the scholarship discourse (Bauni & Jarabi, 2003; Maharaj & Cleland, 2004) on barriers of condom use such as issues of infidelity and lack of trust become emergent constructs that should not be overlooked. Hence, the role of drugs, trust and spouses should be central in future research on married women's ability to negotiate safer sex.

Moderated mediation model

Further, the author of this thesis recommends that future studies extend the discussion to how the ability to negotiate safer sex can mediate the relationship between comprehensive knowledge and HIV/AIDS status among married or cohabiting women (prevalence). Such attempts will extend

the research model of this thesis to a moderated mediation module. More so, there is little evidence supporting the link between safer sex negotiation and other health outcomes (e.g. mental health) (Noar et al., 2006).

Longitudinal study

As stated earlier in the limitations section, correlations do not imply causation remains a drawback in correlational studies; hence a longitudinal study design is proposed. The DHS program conducts periodic surveys; however, the surveys are not a repetition of the same persons observed.

Mixed methods

The research questions posited above is subjected to controlled, objective testing and fit indices that ultimately supports or rejects the hypotheses; hence the use of a quantitative approach in this thesis. However, Ryan (2006) posit that the findings of quantitative research can be the basis for qualitative studies. Given that, in social and behavioural studies, human interactions are complex and subjective, a qualitative study will offer an in-depth understanding of how the experiences of women affect their ability to negotiate safer sex. Considering the strengths and weaknesses of quantitative and qualitative research approaches, they can be extremely effective in combination with one another (Bryman, 2006). Future studies using a mixed method will, therefore, help address a methodological gap in the literature. While measuring sexual behaviour may face participation bias, a triangulation of data from the two approaches may reduce measurement error and home in on the 'truth'.

Conclusion

This thesis adopted the integral theory, to explicate the interplay of determinants at the individual and collective levels to provide a multilevel perspective into determinants that shape women's ability to negotiate safer sex. Differently stated, this thesis extends the discussion beyond the traditional approach of rationality to provide the interactive effect of the contextual role of gender role attitudes and economic status. Not only did this thesis extend the empirical evidence beyond the individualist approach, but gender role attitudes as a contextual variable also has not been previously examined. Thus, the thesis extended the theoretical perspective of gender role attitudes by examining whether within gender differences can explicate the role of comprehensive knowledge of HIV/AIDS prevention on the ability of married/cohabiting women to negotiate safer sex.

This thesis was based on a multilevel moderation model utilizing a nested sample of 1150 married women in 382 clusters from a secondary data of a nationally representative sample from Ghana Demographic and Health Survey 2014 dataset. The key finding of the study is that comprehensive knowledge on HIV transmission influenced women's ability to negotiate for safer sex, but that this process was dependent on gender role attitude and economic status. Specifically, both gender role attitude and economic status moderated the relationship between comprehensive knowledge about HIV/AIDS and the ability to negotiate safer sex. Thus, women who are more subservient weakened the relationship while rich as compared to the not rich strengthened the relationship. Overall, these results suggest that it is important to understand the contextual factors within which a married/cohabiting woman finds herself if we want to understand how comprehensive knowledge of HIV/AIDS is related to ability to negotiate safer sex.

Further, this thesis findings support the argument that the extent to which married/cohabiting women's healthy choices is made the easier choices seems to be determined by structural and the social order. Outlook for future research along with a proposed idea to theoretically extend existing models in sexual health promotion research were discussed. The bottom-line this thesis sought to emphasize is that health promotion strategies through either downstream or up-stream processes highlight the interplay between individual and collective level factors and that a healthy individual life goes together with a good and nurturing society.

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APPENDIX A: Approval letter from DHS Data Office

Jan 28, 2019

Malik halidu
University of Bergen
Norway
Phone: 99866483
Email: halidumalik@yahoo.com
Request Date: 01/27/2019

Dear malik halidu:

This is to confirm that you are approved to use the following SPA Datasets for your registered research paper titled: "Improving Access to HIV/AIDS Services. Why Demographics Matter.":

Ghana, Kenya, Malawi, Namibia, Rwanda, Senegal, Tanzania, Zambia

To access the datasets, please login at: https://www.dhsprogram.com/data/dataset_admin/login_main.cfm. The username is the registered email address, and the password is the one selected during registration.

The IRB-approved procedures for DHS public-use datasets do not in any way allow respondents, households, or sample communities to be identified. There are no names of individuals or household addresses in the data files. The geographic identifiers only go down to the regional level (where regions are typically very large geographical areas encompassing several states/provinces). Each enumeration area (Primary Sampling Unit) has a PSU number in the data file, but the PSU numbers do not have any labels to indicate their names or locations. In surveys that collect GIS coordinates in the field, the coordinates are only for the enumeration area (EA) as a whole, and not for individual households, and the measured coordinates are randomly displaced within a large geographic area so that specific enumeration areas cannot be identified.

The DHS Data may be used only for the purpose of statistical reporting and analysis, and only for your registered research. To use the data for another purpose, a new research project must be registered. All DHS data should be treated as confidential, and no effort should be made to identify any household or individual respondent interviewed in the survey. Please reference the complete terms of use at: https://dhsprogram.com/Data/terms-of-use.cfm.

The data must not be passed on to other researchers without the written consent of DHS. Users are required to submit an electronic copy (pdf) of any reports/publications resulting from using the DHS data files to: archive@dhsprogram.com.

Sincerely,

Bridgette Wellington

Bridgette Wellington Data
Archivist
The Demographic and Health Surveys (DHS) Program

APPENDIX B: **Descriptive statistics of married women ability to negotiate safer sex**

Composite scale	N	(%)
Cannot refuse sex or request condom use if she knows that her husband has an STI	334	18.27
Can either refuse sex or request condom use if she knows that her husband has an STI	420	22.98
Can refuse sex or request condom use if she knows that her husband has an STI	1,074	58.75
Sub- dimensions		
She can refuse sex		
Yes	1362	74.6
No	414	22.7
Don't know	51	2.79
Missing	1	
She can request partner to use condom		
Yes	1206	66
No	542	29.67
Don't know	79	4.32
Missing	1	-
Total	1150	

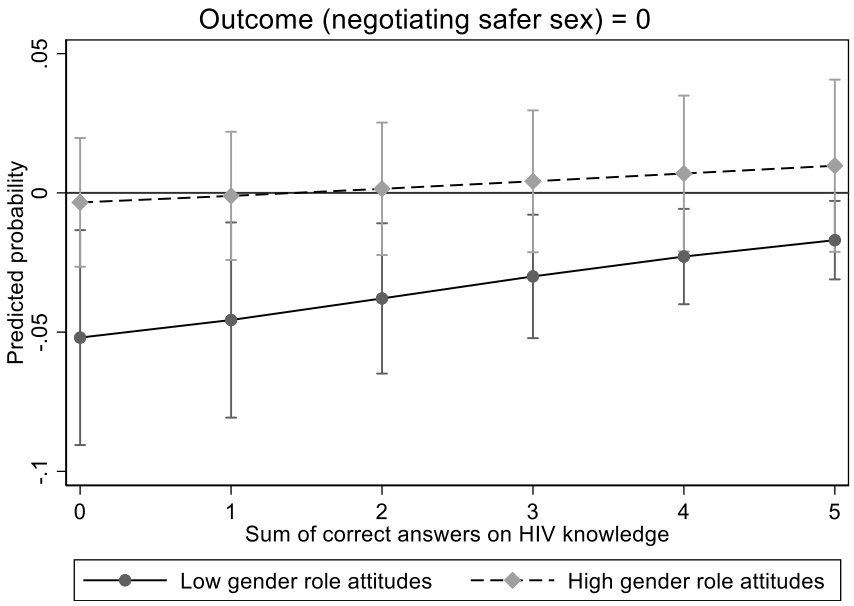
APPENDIX C: **Descriptive statistics of comprehensive Knowledge of HIV/AIDS**

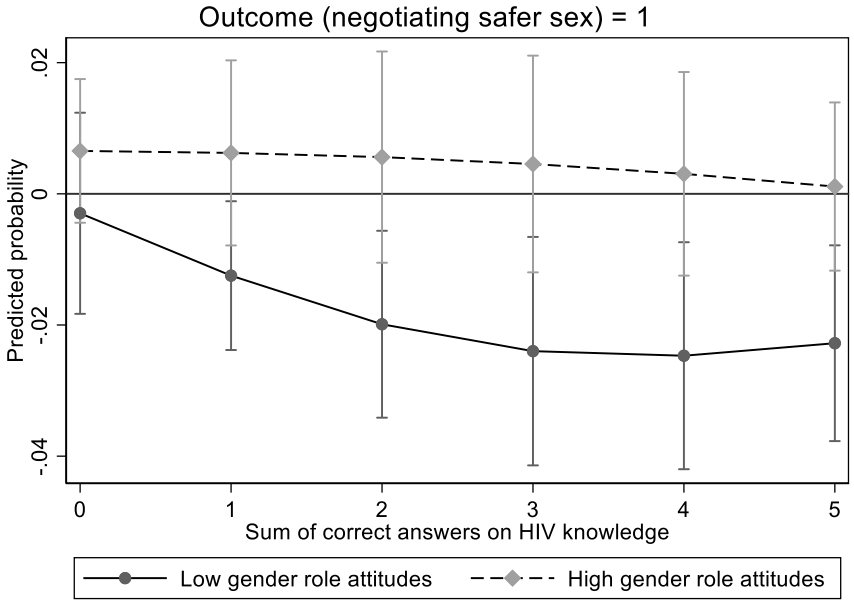
Composite scale score		N (1828)	(%)
correctly answered all five questions		456	25.44
correctly answered at least four questions		574	31.40
correctly answered at least three questions		411	22.48
correctly answered at least two questions		193	10.56
correctly answered at least one question		69	3.77
did not give correct answers to any of the five questions		116	6.35
Sub- dimensions			
Reduce risk of getting HIV: always use condoms during sex	Yes	1331	75.75
Yes	No	316	17.99
No	Don't know	110	6.26
Don't know			
	missing	72	
	Yes	1,518	86.45
	No	185	10.54
Reduce risk of getting HIV: have one sex partner only, who has no other partners	Don't know	53	3.02
	missing	72	
	Yes	1400	79.68
	No	279	15.88
	Don't know	78	4.44
A healthy-looking person can have HIV	missing	71	
Can get HIV from mosquito bites		659	37.51
Yes		949	54.01
No		149	8.48
Don't know		71	
Missing			
Can get HIV by sharing food with person who has aids			
Yes		561	63.23
No		1111	31.93
Don't know		85	4.84
Missing		71	

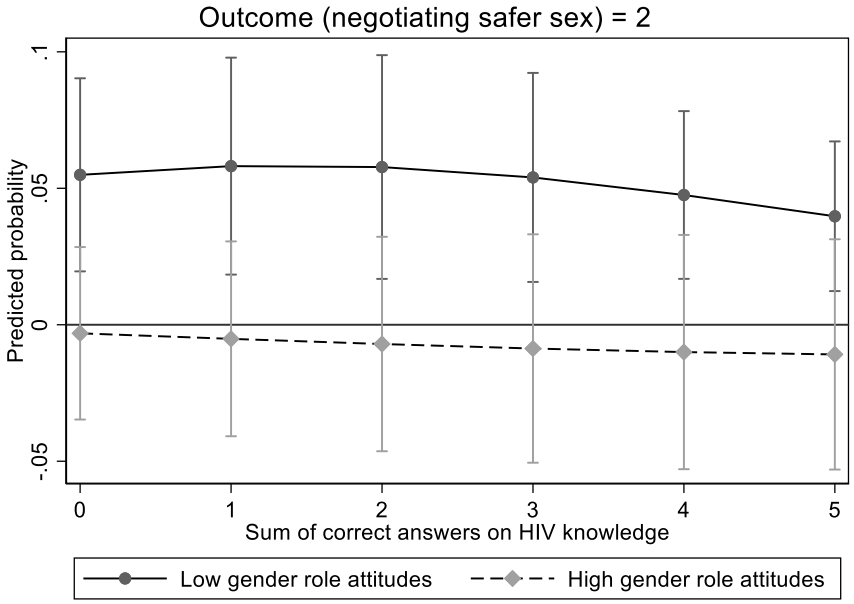
APPENDIX D: **Descriptive statistics of married women's response to gender role attitudes**

Composite scale score	N (1828)	(%)
Married women who said no to all the five separate reasons justifying a husband beating his wife	1216	66.52
Married women who said yes to at least four of the separate reasons justifying a husband beating his wife	86	4.70
Married women who said yes to at least three of the separate reasons justifying a husband beating his wife	127	6.95
Married women who said yes to at least two of the separate reasons justifying a husband beating his wife	139	7.60
Married women who said yes to at least one of the separate reasons justifying a husband beating his wife	143	7.82
Married women who said yes to all the five separate reasons justifying a husband beating his wife	117	6.40
Sub- dimensions		
Beating justified if wife goes out without telling husband		
Yes	392	21.44
No	1432	78.34
Don't know	4	0.22
Beating justified if wife neglects the children		
Yes	470	25.71
No	1,354	74.07
Don't know	4	0.22
Beating justified if wife argues with husband		
Yes	371	20.30
No	1453	79.49
Don't know	4	0.22
Beating justified if wife refuses to have sex with husband		
Yes	319	17.45
No	1506	82.39
Don't know	3	0.16
Beating justified if wife burns the food		
Yes	179	9.79
No	1646	90.04
Don't know	3	0.16

APPENDIX E: Predictive Margins of Gender Role Attitudes with 95% CIs







APPENDIX F: Predictive Margins of Economic Status with 95% CIs